Appendix F
Structures Inspection Results

1 Introduction

The results of the Lower Duwamish Waterway (LDW) upper reach structures field inspection, visual observation, and evaluation are detailed in the facility condition assessment (FCA) reports included in this appendix. Types of structures that were inspected are identified in Table F-1. The attached FCA reports include the following:

- Facility name and property information, where known
- Facility identification – ST (Structures) and OF (Outfalls)
- WUS# – Waterway User Survey identification number
- Location – river mile, station, and side of river
- Relevant background information, photographs, and description of observed presence or absence of defects or deficiencies in individual elements of the structure
- Overall structure rating (not considering landside inspection that may be conducted)
- Accessibility for field investigation, construction equipment, and remediation activities
- Observed hazards
- Material inspection checklist form and element condition rating

Two rounds of inspections were completed in accordance with the LDW Pre-Design Investigation (PDI) Quality Assurance Project Plan (QAPP) and QAPP Addendum (Windward and Anchor QEA 2020; Anchor QEA and Windward 2021), including the Phase I visual inspection and the Phase II detailed inspection. During the Phase I visual inspection, structures and outfalls along the entire upper reach were inspected and information was documented to the extent possible based on visual and access limitations. The Phase II detailed structures inspection built on data collected during Phase I but focused on structures and outfalls within or near Phase I RAL exceedance areas.

FCA reports for structures and outfalls that were inspected in both Phase I and Phase II of the PDI are included in Attachments F-1a and F-1b. These reports note the separate inspection dates and present combined data from both inspections. FCA reports structures and outfalls that were only inspected during Phase I are included in Attachments F-2a and F-2b.

2 Conditions Descriptions and Results

The overall structure ratings provide a general assessment of the structures' conditions, not an indication of their strength to support their intended design load or functional use. Overall ratings are based on American Society of Civil Engineers Manual of Practice No. 101 (Childs 2001) and are categorized as follows:

- **Good:** Structure has no significant problems and only minor defects/deficiencies were noted.
- **Satisfactory:** Structure has minor to moderate defects/deficiencies.

- **Fair:** Structure has minor to moderate defects/deficiencies, but all primary structural elements remain in sound condition. Localized areas of moderate to major defects and/or deterioration may be present but do not significantly reduce the load-bearing capacity of the structure.
- **Poor:** Structure has major severe defects/deficiencies and/or deterioration is observed on widespread portions of the structure.
- **Serious:** Structure has severe defects; deterioration, overstressing, and/or breakage is observed on primary structural elements. Localized failures are observed or possible to occur.
- **Critical:** Structure has severe defects/deficiencies, deterioration, overstressing, and/or breakage that has resulted in localized failures of primary structural elements. Widespread failures are possible or likely to occur.

The overall structure ratings for ST-01 through ST-21 are summarized in Table F-1a. Structures ratings are not provided for outfalls. The overall outfall conditions are summarized in Table F-1b.

Table F-1a
Summary of Structure Conditions

Facility ID	WUS #	Facility Name or Description	Inspection Phase	Asset Type	Condition Assessment
ST01	38	Boeing Plant 2	I	Pile-supported building	Satisfactory
ST02	57	South Park Bridge (16th Ave S Bridge)	I, II	Vehicular bridge, abutment, piers, fender piles	Good
ST03	65	Star Forge, Boeing, Central Properties	I, II	H-pile bulkheads, timber, lagging bulkheads	Serious
				Sheet pile bulkheads, tied back sheet pile bulkheads, riprap	Good
ST04	41	Northwest Container Services	I, II	Piers	Serious
				Dolphins	Fair
ST05	44	Boeing Wharf (Slip 6)	I, II	Wharf, piers	Poor
ST06	50	Overhead Power Line Crossing	I	Overhead crossing	Satisfactory
ST07	66	Timber Groins and Wharf	I, II	Wharf, groins, riprap, platform	Poor
ST08	16	S 98th Street (Boeing) Bridge	I, II	Vehicular bridge, piers, abutment	Good
ST09	None	Miscellaneous Bulkhead - 1	I	Bulkheads	Poor
ST10	None	Miscellaneous Piles - 1	I, II	Pile field	Poor

Facility ID	WUS #	Facility Name or Description	Inspection Phase	Asset Type	Condition Assessment
ST11	None	Miscellaneous Piles - 2	I	Pile field	Poor
ST12	43	Delta Marine Industries	I/II	Wharf, pier, riprap, bulkhead, floats, debris deflector	Good
ST13	None	Breakwater	I	Timber breakwater, debris deflector	Fair
ST14	None	Travel Lift Pier	I	Boat lift	Satisfactory
ST15	42	Duwamish Yacht Club	I	Marina, bulkhead, guide piles	Fair
ST16	40	Kelly Ryan (McElroy George and Assoc., Inc) Pier	I	Pier	Fair
ST17	None	Miscellaneous Piles - 3	I, II	Pile field	Poor
ST18	None	Miscellaneous Piles - 4	I	Pile field	Poor
ST19	6	T-117 Cleanup Site	I, II	Bulkhead, debris barrier, float	Good
ST20	39	South Park Marina	I, II	Marina, bulkhead, guide piles	Fair
ST21	None	Miscellaneous Piles - 5	I	Pile field	Poor

Notes:
ID: identification
T-117: Terminal 117

Table F-1b
Summary of Outfall Conditions

Facility/Ecology ID	Inspection Phase	Active/Inactive	Condition Assessment[1]
Boeing 1	I	N/A	N/A
BDC-1	I	N/A	N/A
BDC-2	I, II	Unknown	Poor
BDC-5	II	Unknown	TBD
Ditch #2	I	N/A	N/A
SP3	I	N/A	N/A
T-117	I, II	Unknown	TBD
2061	I, II	Active	Satisfactory
2062	I, II	Active	Satisfactory
2063	I, II	Inactive	Satisfactory
2064	I	N/A	N/A
2065	I	N/A	N/A
2072	I, II	Active	Satisfactory
2073	I, II	Inactive	N/A
2074	I, II	Inactive	N/A

Facility/Ecology ID	Inspection Phase	Active/Inactive	Condition Assessment[1]
2075	I, II	Unknown	TBD
2076	I, II	Unknown	TBD
2077	I, II	Active	Satisfactory
2080	I	N/A	N/A
2081	I	N/A	N/A
2082	I	N/A	N/A
2087	I	N/A	N/A
2088	I	N/A	N/A
2089	I	N/A	N/A
2090	I	N/A	N/A
2092	I, II	Unknown	TBD
2093	I, II	Unknown	TBD
2094	I, II	Inactive	N/A
Norfolk CSO/SD (2095)	I, II	Active	Satisfactory
2096	I, II	Unknown	Satisfactory
2097	I, II	Unknown	TBD
2098	I	N/A	N/A
2100B	I	N/A	N/A
2214	I, II	Unknown	Satisfactory
2215	I, II	Unknown	Satisfactory
3031	I	N/A	N/A
3032	I	N/A	N/A

Notes:
1. Overall condition assessments and active/inactive status were completed/determined as part of Phase II; therefore, outfalls that were only inspected during Phase I do not have a condition assessment.
CSO: combined sewer overflow
ID: identification
N/A: not applicable
SD: storm drain
T-117: Terminal 117
TBD: to be determined

In addition to overall structure ratings, the FCA reports for structures include a material conditions rating, which is a general description of the condition of primary materials used in the construction of a structure (e.g., timber, concrete, steel). The material conditions rating indicates whether a structural element has lost any of its design area (i.e., loss of material cross section) that can change the engineering properties of the structural element. Again, these ratings provide a general assessment of the structural element or component integrity and are not an indication of the

structures' strengths to support their intended design load or functional use. Materials condition ratings for each observed structure are categorized as follows:

- **Excellent:** New or near-new condition; no loss of material cross section.
- **Good:** No significant issues or concerns; <5% loss of material cross section.
- **Fair:** Some wear observed but no significant issues/concerns; between 5 and 20% loss of material cross section.
- **Poor:** Significant wear observed; between 20 and 50% loss of cross section.
- **Critical:** Extremely worn or damaged; between 50 and 80% loss of cross section.

3 References

Anchor QEA, Windward. 2021. Quality assurance project plan addendum: pre-design surveys of the Lower Duwamish Waterway upper reach. Final. Submitted to EPA June 25, 2021. Anchor QEA and Windward Environmental LLC, Seattle, WA.

Childs KM. 2001. Underwater Investigations: Standard Practice Manual. American Society of Civil Engineers.

Windward, Anchor QEA. 2020. Lower Duwamish Waterway quality assurance project plan for remedial design of Upper Reach: pre-design investigation. Final. Submitted to EPA May 19, 2020. Windward Environmental LLC and Anchor QEA, Seattle, WA.

4 Attachments

Attachment F-1a	Phase II Detailed Inspection FCA Reports: Structures
Attachment F-1b	Phase II Detailed Inspection FCA Reports: Outfalls
Attachment F-2a	Phase I Visual Inspection FCA Reports: Structures
Attachment F-2b	Phase I Visual Inspection FCA Reports: Outfalls

Appendix F
Attachment F-1a Phase II Detailed Inspection FCA Reports: Structures

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/07/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST02
South Park Bridge (16th Ave S Bridge)
Parcel No. N/A

WUS#: 57

Facility Location: River Mile 3.3

Direction (side) Both

STA 266+50 and STA 501+30

Site Overview

Asset Type: Bascule Bridge

Use: Vehicular Bridge

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. Physical measurements or close up observations were collected where possible.

The structure consists of:

- Each end of the Bascule Bridge (main span) is supported on a concrete Bascule pier within the navigation channel (Photo 1).
- Fender pile system on the navigable channel-side of the Bascule piers (Photos 1 and 2).
- The east and west approach spans are supported on concrete bents outside the waterway (Photos 1, 3, and 4).
- East and west shoreline embankments are protected with riprap (Photos 3 and 4).
- The concrete surface of the Bascule piers appears to be in good condition, except for some scattered marine growth in the tidal zone (Photos 5, 6, and 7). No damage was observed.

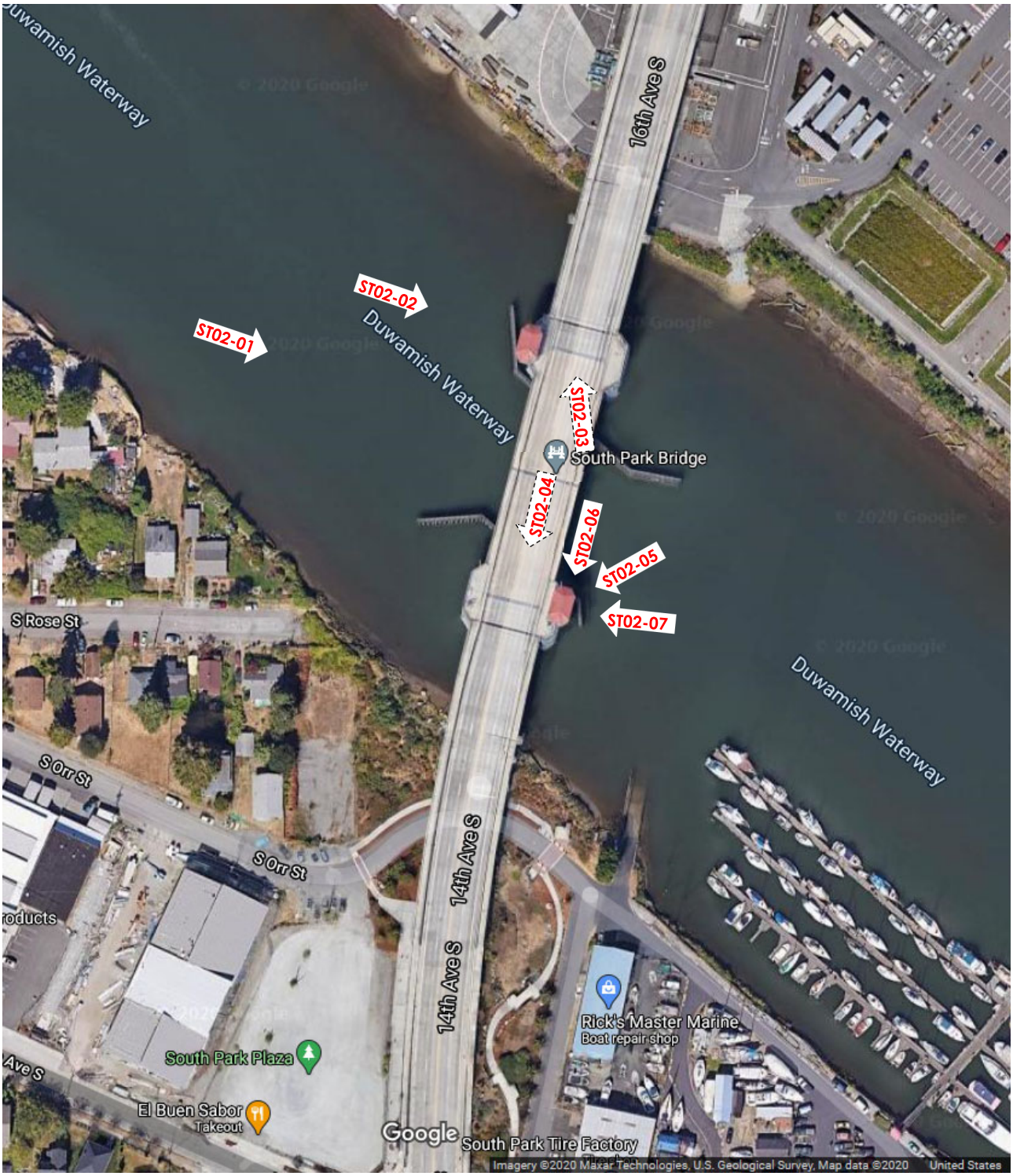
Accessibility:

- Elements around the Bascule piers are accessible, but may be limited outside the navigable channel.
- Vessel size may be limited when the Bascule Bridge is in the closed position.

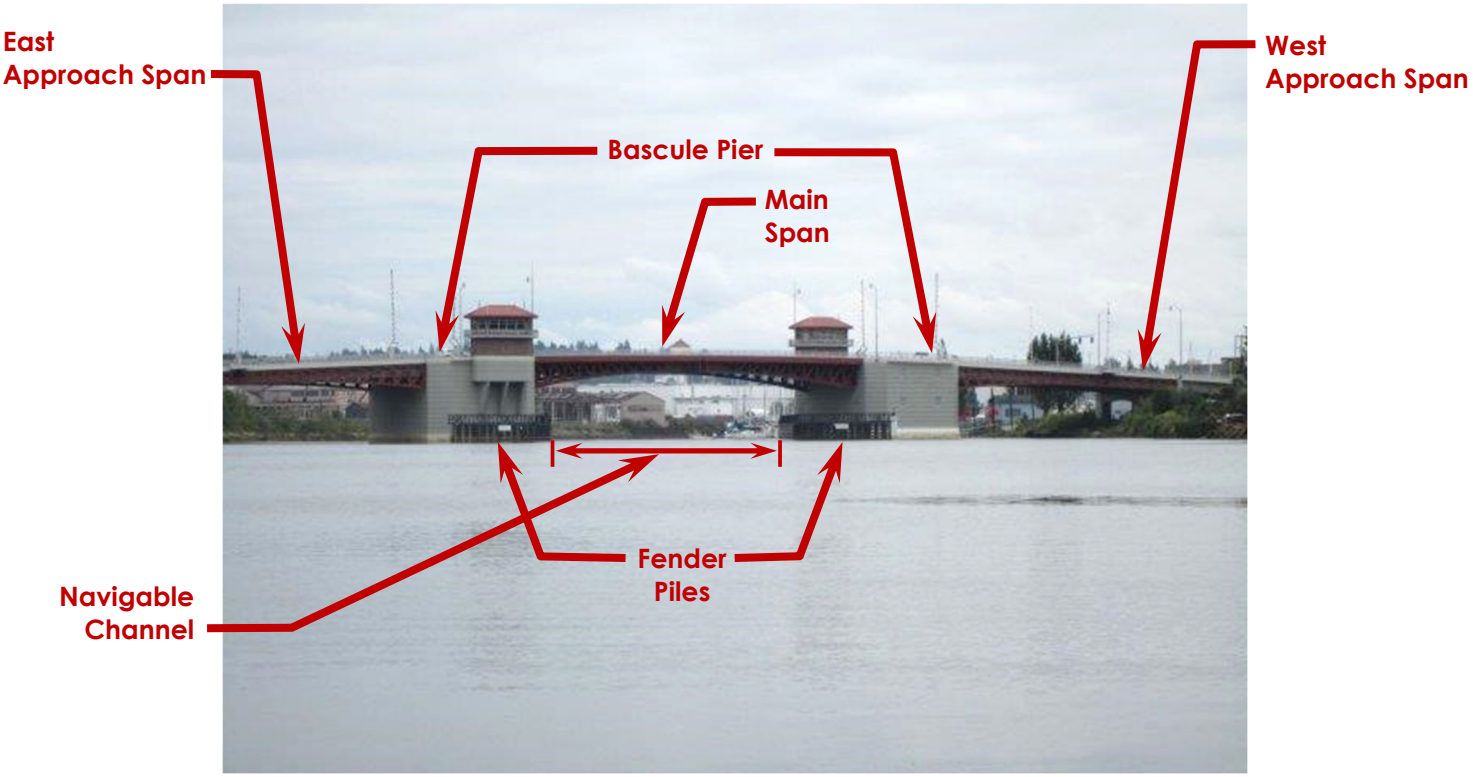
Potential Hazards:

- Vessel clearance outside the navigation channel.

VICINITY MAP



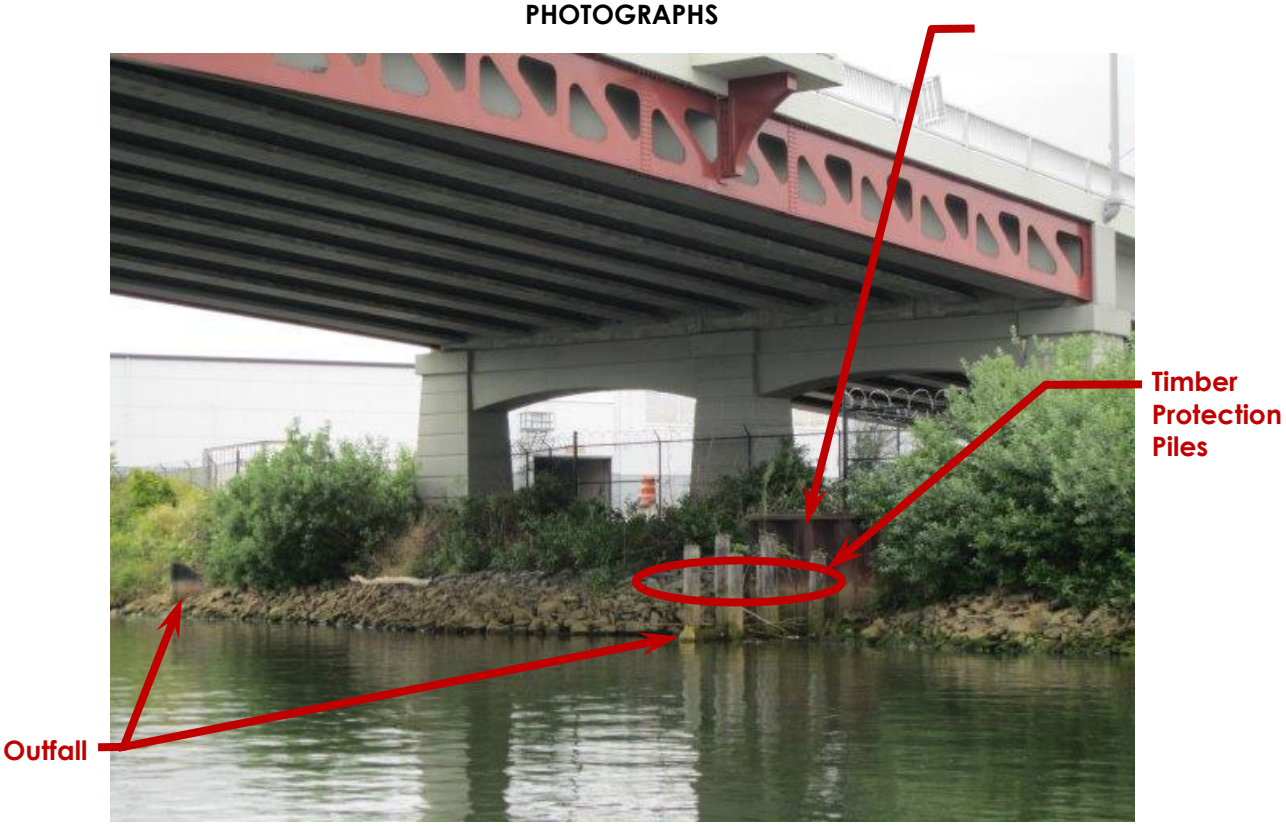
PHOTOGRAPHS



ST02-01: Bridge Main Span

ST02-02: Fendering System

PHOTOGRAPHS



ST02-03: East Bent

ST02-04: West Bent

PHOTOGRAPHS

ST02-05: West Bascule Pier (south)

ST02-06: West Bascule Pier (east side)

PHOTOGRAPHS

ST02-07: West Bascule Pier (southeast side)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST03
Star Forge, Boeing, and Central Properties
Parcel Nos. 1600020, 1600023, 1600014, 7400053, 54226000060

WUS#: 65

Facility Location: River Mile 3.7 to 4.0

Direction (side) East

STA 283+50 to STA 308+00

Site Overview

Asset Type: Assorted Bulkheads, Ripraps

Use: Cleanup Containment

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were collected.

The structure consists of:

- Starting from the north (downstream) end, this structure consists of a series of riprap along this stretch of shoreline and bulkheads (segments), including:
  - Riprap shoreline protection (Photo 1).
  - Steel sheet pile bulkhead (Photo 2).
  - Riprap shoreline protection (Photos 3 and 4).
  - Steel sheet pipe bulkhead (Photo 5).
  - Steel H-pile bulkhead with a wide variety of lagging, concrete panels, cross bracing, remnant concrete panel rubbles, timber (Photos 6 to 15).
  - Tied back steel sheet piles with timber fender pile (Photos 16 and 17).
  - Steel sheet pile bulkhead with timber fender pile (Photo 18).
  - Timber piles and lagging (Photo 19 to 25).
- Close observation was conducted where possible. However, except for the two relatively new segments of steel pile bulkheads (Photos 2, 6, and 7) which appear to be in good condition, the remainder of the bulkhead segments are in various states of indetermination.

Bulkhead

- In the bank, protection consists of closely spaced timber stub piles with timber lagging behind the piles (Photos 19 to 25).
- The tops of the piles are generally rotted or splintered, but the lower sections appear sound (Photos 20 to 25).
- Lagging in a number of areas are rotted and soil erosion through the bulkhead was observed (Photos 22 to 25).
- Pile embedment and the condition below mudline are not known.

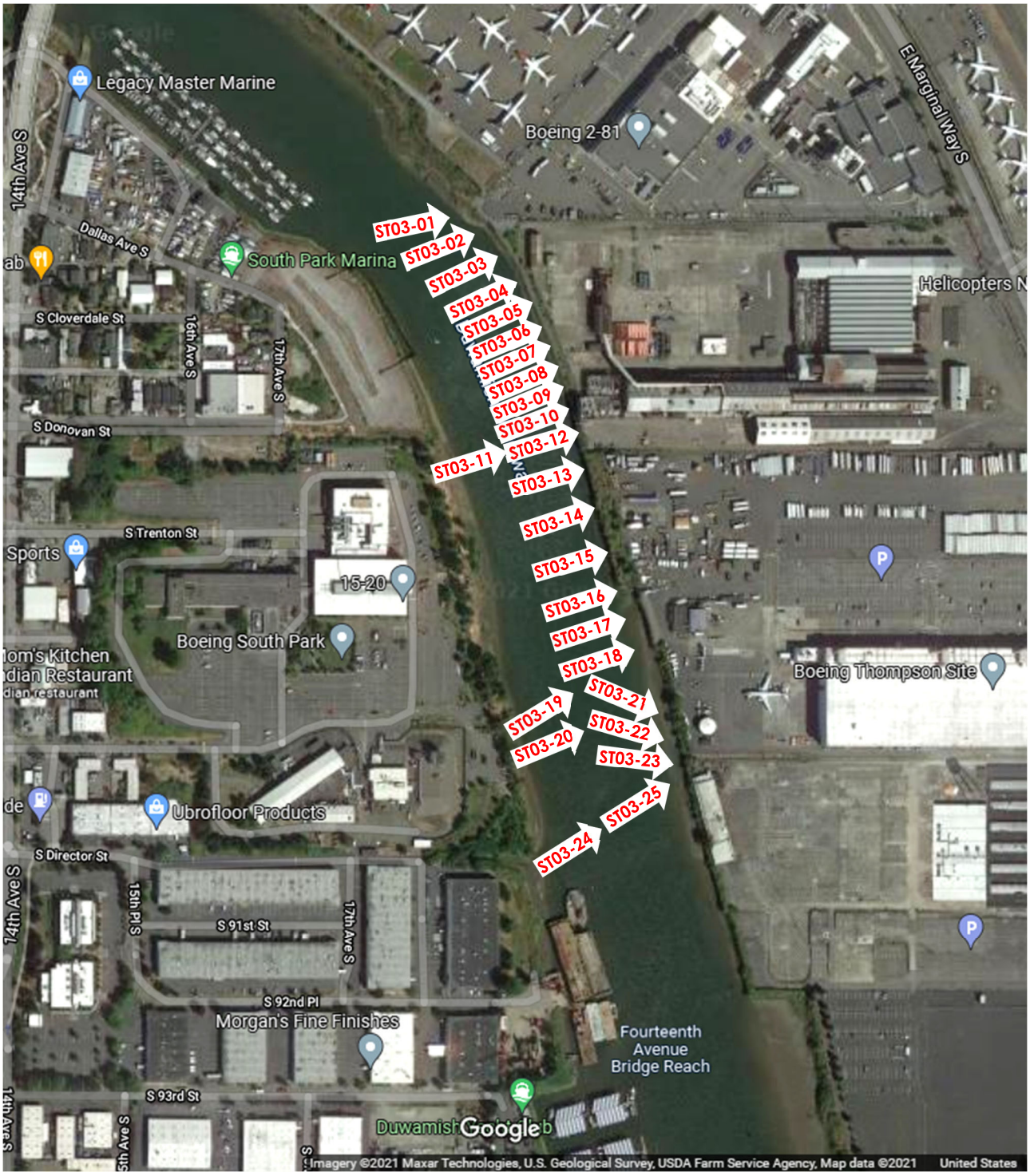
Accessibility:

- The structure is all in-water and is accessible from the water side.

Potential Hazards:

- There are no overhead or underwater structures observed.
- Stability of segments of the bulkhead may be questionable.

VICINITY MAP



PHOTOGRAPHS

Photo ST03-01: Riprap Section

Photo ST03-02: Sheet Pile Bulkhead Section

PHOTOGRAPHS

Photo ST03-03: Riprap Section

Photo ST03-04: Riprap Section

PHOTOGRAPHS

Photo ST03-05: Sheet Pile Bulkhead (north end)

Photo ST03-06: Sheet Piles (south end)

PHOTOGRAPHS

Photo ST03-07: H-Piles with Concrete Lagging (south end)

Photo ST03-08: H-Piles with Concrete Panels

PHOTOGRAPHS

Photo ST03-09: H-Piles with Concrete Panel Rubbles

Photo ST03-10: H-Piles with Concrete Panel Rubbles

PHOTOGRAPHS

Photo ST03-11

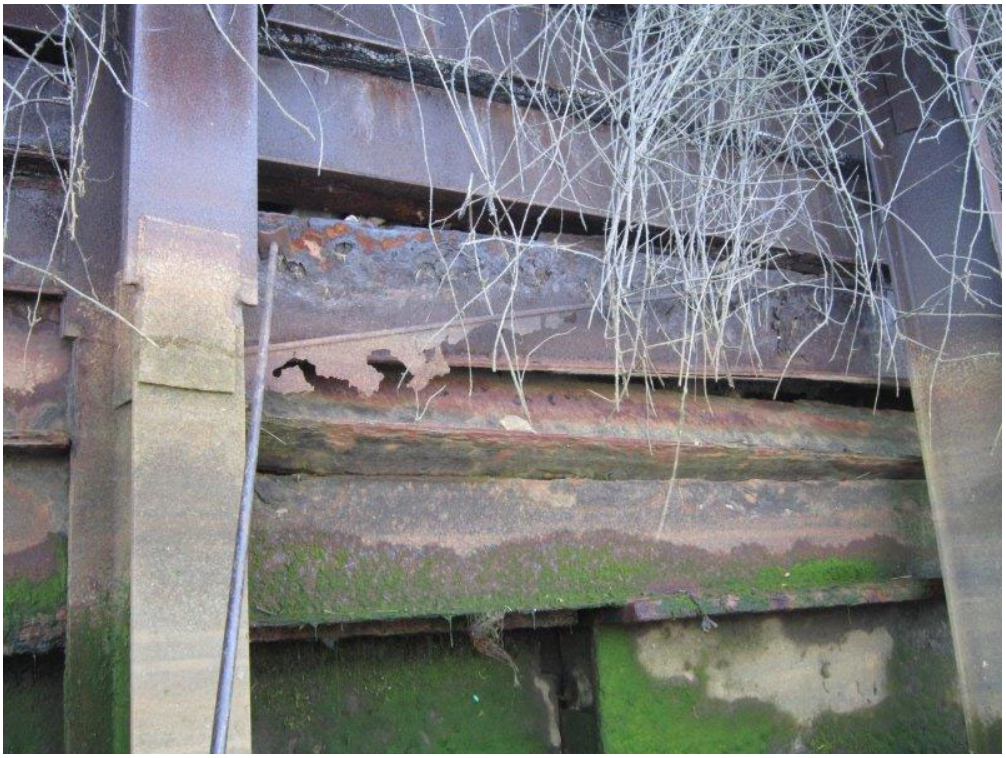


Photo ST03-12

PHOTOGRAPHS

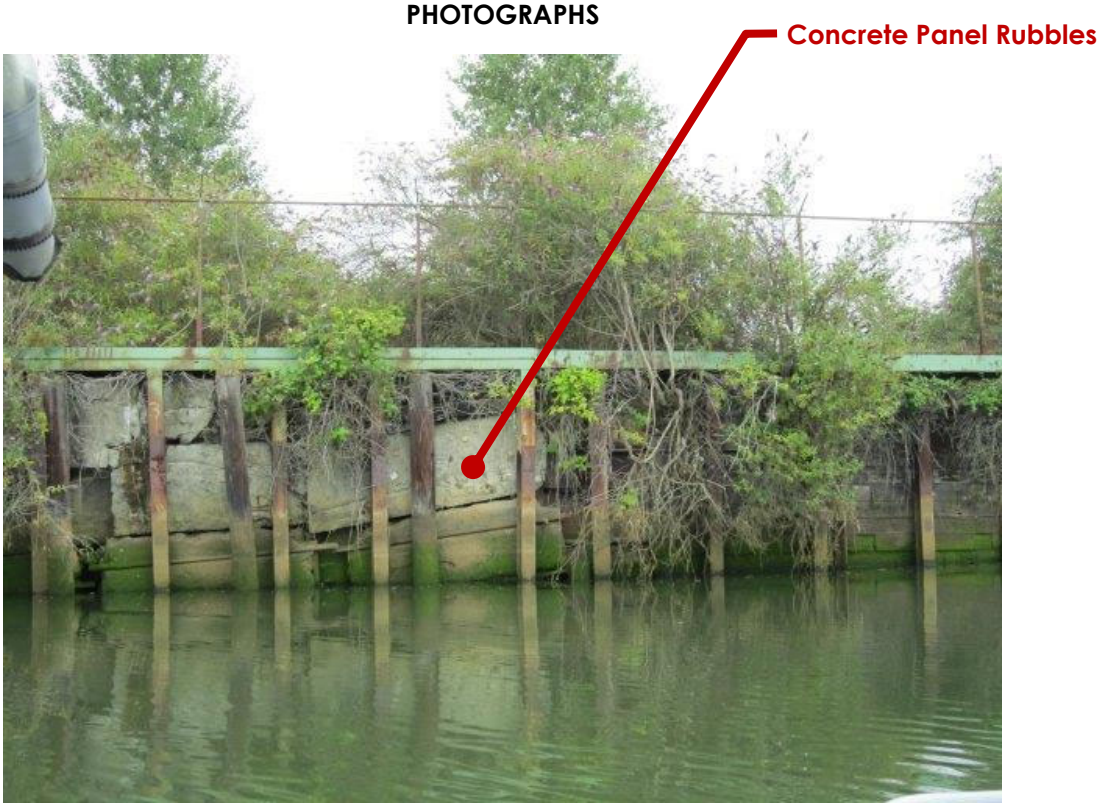


Photo ST03-13: H-Piles with Concrete Panel Rubbles

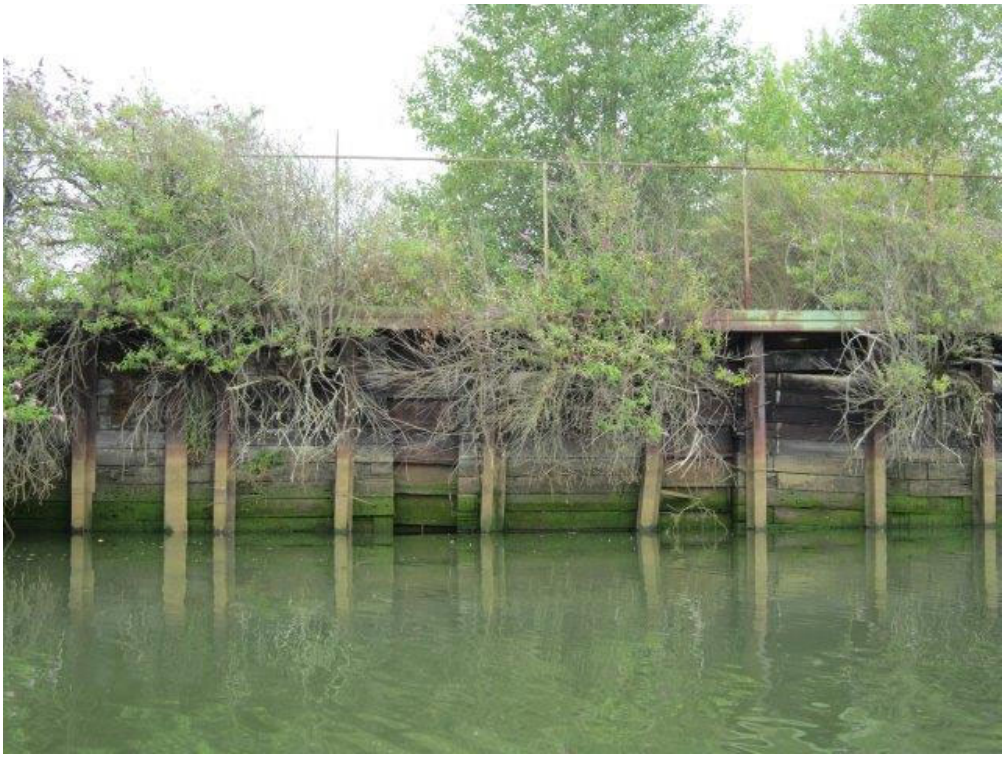


Photo ST03-14: H-Piles with Timber Lagging

PHOTOGRAPHS

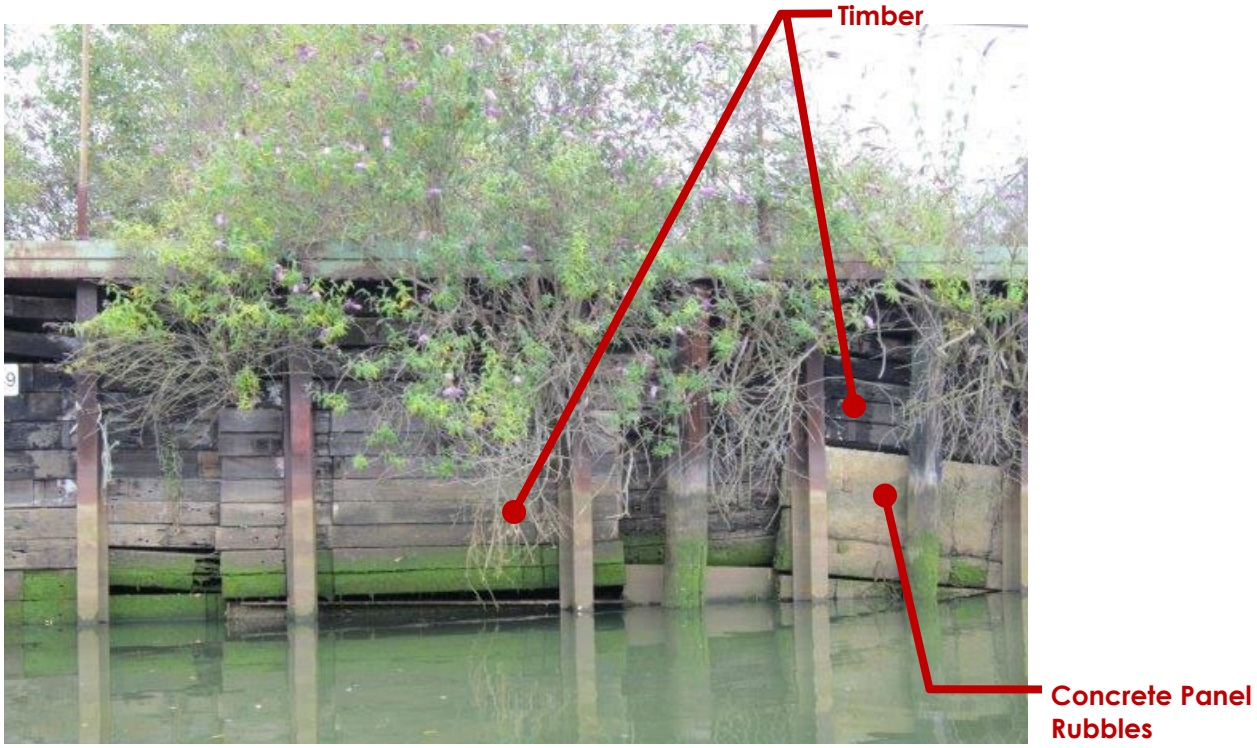


Photo ST03-15: H-Pile with Timber Lagging

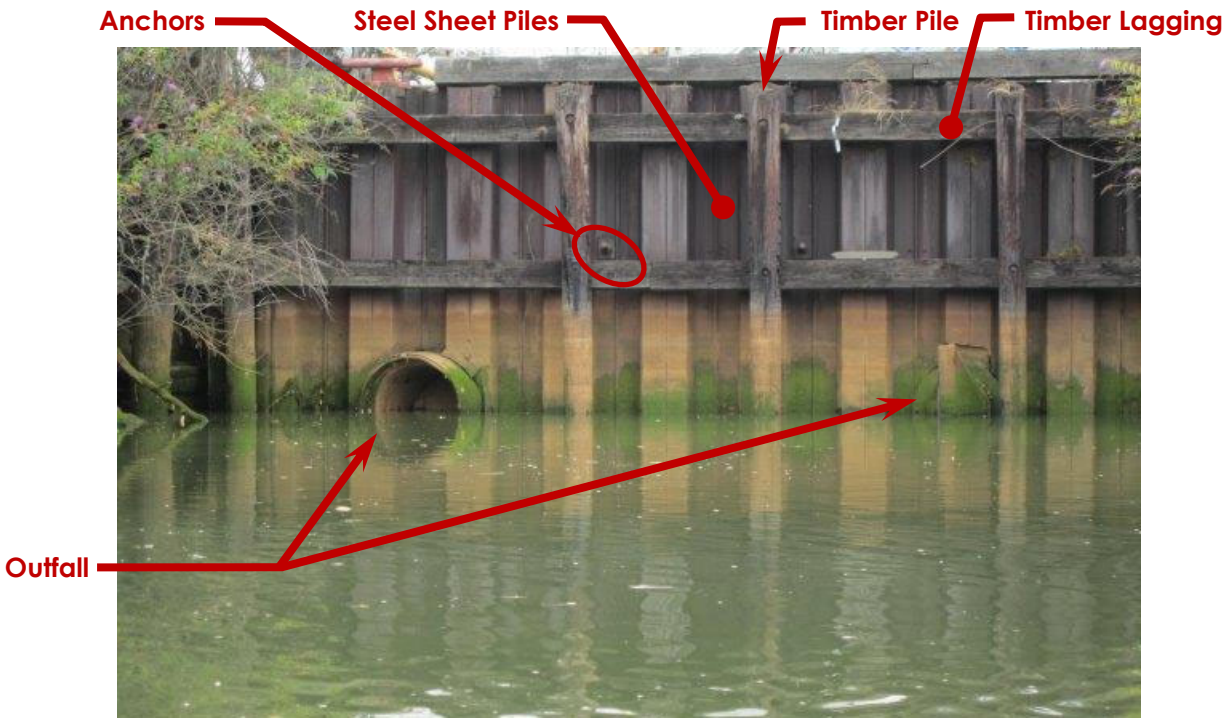


Photo ST03-16: Hybrid Tie-back Bulkhead

PHOTOGRAPHS

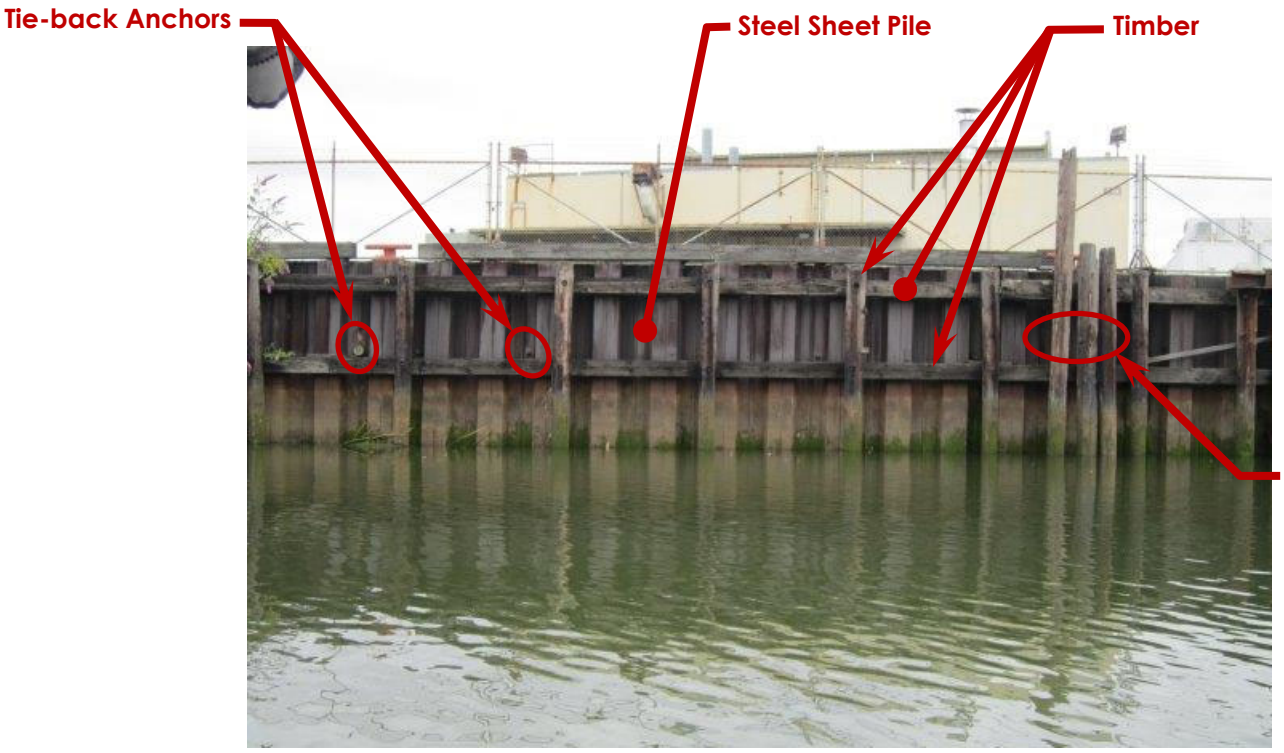


Photo ST03-17: Hybrid Tie-back Bulkhead (north end)

Photo ST03-18: Hybrid Bulkhead (south end)

PHOTOGRAPHS

Photo ST03-19

Photo ST03-20

PHOTOGRAPHS

Photo ST03-21

Photo ST03-22

PHOTOGRAPHS

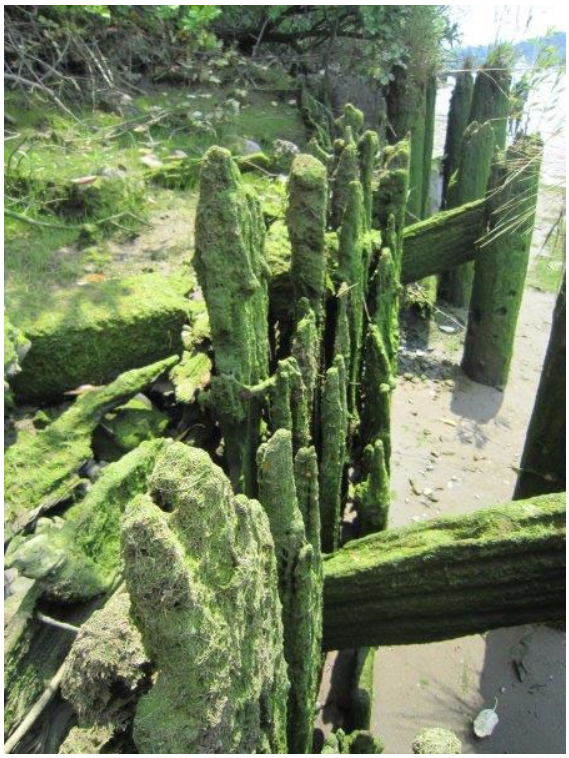


Photo ST03-23

Photo ST03-24

PHOTOGRAPHS

Photo ST03-25: Bulkhead Lagging Beneath Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST04
Northwest Container Services
Parcel No. 5422600010

WUS#: 41

Facility Location: River Mile 4.0

Direction (side) East

STA 313+50 to STA 317+50

Asset Type: Piers, Dolphins

Use: Barge Moorage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☒ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas. Physical measurements or close up observations were collected where possible.

The structure consists of:

Pier

- L-shaped pier of two (2) treated timber pile bents – One (1) leg extends west from the shore and the other offshore leg extends to the south (Photos 1 to 4).
- The pier is delapitated and not in use – Several piles are missing or broken. Decking and cross bracing members are missing.

Dolphins

- Along the south and west side of the pier are several 7-timber treated pile dolphins; some are missing piles. The dolphins are still in use (Photo 1, 2, and 5).
- The cluster of piles are strapped together with a combination of fiber and/or strand wire rope. Some straps are broken or missing (Photos 5 and 6).
- Some piles are eroded and have lost material thickness. However, the core appear to be sound (Photo 7).

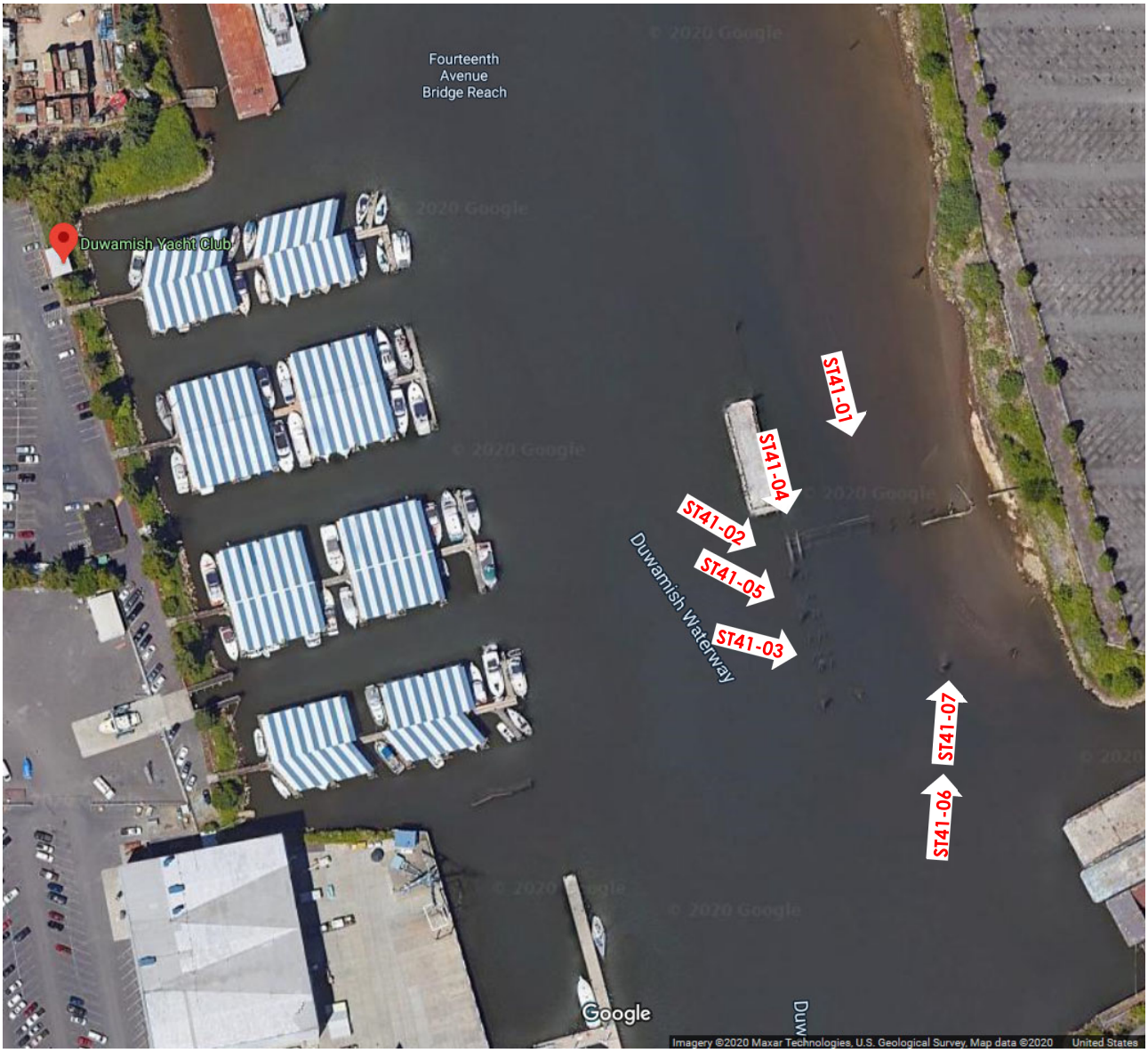
Accessibility:

- The structure is mostly inaccessible from all directions; limited by pile spacing, approximately 10-foot horizontal clearance.

Potental Hazards:

- Some of the piles may be unstable.

VICINITY MAP



PHOTOGRAPHS

Photo ST04-01: L-Shaped Pier and Dolphins (Looking South)

Photo ST04-02: L-Shaped Pier and Dolphins (Looking South)

PHOTOGRAPHS

Photo ST04-03: South End of Pier

Photo ST04-04: Pile Bent Looking South

PHOTOGRAPHS

Photo ST04-05: Dolphins

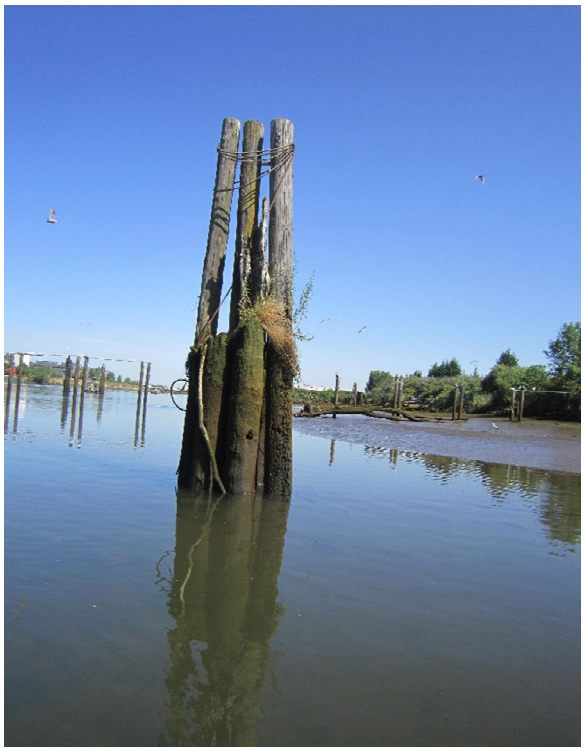


Photo ST04-06: Dolphin

PHOTOGRAPHS

Photo ST04-07: Closeup of Pile Damage

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST05
The Boeing Company Seattle Wharf (Slip 6)
Parcel No. 5624201032

WUS#: 44

Facility Location: River Mile 4.1

Direction (side) East

STA 318+00 to STA 341+00

Asset Type: Wharf – 6 Concrete Piers

Use: Barge mooring

Inspection Date: June 15, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were collected on the deck at this site.

Structure consists of six (6) concrete piers slipway along the south river bank. Each pier is approximately 60-ft long (in the N-S Direction) and typically composed of:

- Two (2) rows of a combination of five (5) vertical and battered octagonal prestressed concrete piles.
- 36"wide x 42"deep concrete pile cap at approximately 21-ft on center.
- Nine (9) precast concrete haunched pier decks.
- Four (4) sets of timber fender piles on the north face.

Along the south bank and between the piers is a concrete apron supported on two (2) rows of seven (7) prestressed concrete octagonal piles, concrete cap beams, and concrete deck. The apron structure was not accessible and therefore the size and spacing of the members were not measured. The apron appears to be used for mooring.

The bank is protected with concrete bulkhead and riprap at the toe of the bulkhead/bank.

Pier 1 (East Most)

- The timber fender piles are generally intact except for the loose or missing straps. (Photos 1 and 2) The top of the piles apprea to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.

- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles (Photos 3 and 5).
- Along the length of the lower part of the pile cap is a crack. This is typical on all pile caps. (Photo 5)
- The pile caps are in good condition except for a loose concrete spall on the east face near the top of the cap and (b) mortar surface erosion in the splash zone (Photos 3 and 4).
- Pier decks are in good condition except for corrosion of exposed reinforcing bar in one of the panels (3rd panel from the north) and some rust stains between the 4th and 5th panel (Photos 6 and 7).

Pier 2

- Several timber fender piles are missing, broken, damaged, or missing straps. (Photos 9 and 10) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The cap beams are in good condition except damage to the top of the west cap that exposes some reinforcing steel(Photos 10 and 11).
- The pier decks are in good condition except for portion of the west side of the first concrete deck panel is broken or partially demolished exposing some reinforcing bars (Photos 12 and 13).

Pier 3

- Several timber fender piles missing with some loose or missing straps. (Photo 15) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The pile caps are in good condition except for the north end of the east cap beam is wider and the west pile cap is deeper than the typical cap configuration (Photos 15 and 16).
- Concrete pier decks are in good condition (Photo 17).

Pier 4

- A few timber fender piles missing with some loose or missing straps. (Photo 19) The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles.
- The pile caps are in good condition except for the pile caps are approximately 32"wide x 42"deep and the depth of the west cap over the first pile is deeper than typical.
- Concrete pier decks are in good condition (Photo 20).

Pier 5

- Several timber fender piles missing or broken with some loose or missing straps. (Photo 22) The tops of several piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles. The top 6-in of the first pile to the east appears to be field built up and contains rock pockets (Photo 23).

- The pile caps are in good condition except for the pile caps are 32"wide x 42"deep, wider than typical dimensions.
- Concrete pier decks are in good condition (Photo 24)

Pier 6 (West Most)

- Most timber fender piles are missing, broken, or damaged. Some with loose, damaged, or missing straps (Photos 26 and 27). The tops of the piles appear to be rotted due to weather exposure and subsequent vegetation growth. The body of the piles within and above the splash zone appear to be sound and in good condition. Pressure treatment appears to be in good condition.
- The concrete piles are in good condition except for mortar surface erosion in the wet/dry zone of the piles (Photos 28 and 29).
- The pile caps are in good condition except for the pile caps are wider than typical dimensions (Photos 28 and 29).
- Concrete pier decks are in good condition except for damage at top west corner with broken concrete and exposed reinforcing steel (Photos 27 to 29).

Wharves

- Wharves are located between all piers and extend westward past Pier 6; there is not a wharf east of Pier 1.
- Appears to be in good condition, no damage was observed.

Accessibility:

- Horizontal bents clearance (east to west) is about 18 feet. Vertical clearance under the pile cap (between bent) is about 7'-10" at 2-foot tide level.
- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- Each of the piers are accessible along the east and west sides. Access to the north sides are obstructed by the fender piles.
- Wharf is accessible by vessel, but not beyond the outboard concrete piles.

Potential Hazard:

Pier 1

a) Falling debris hazard due to loose concrete spall (Photos 3 and 4).
b) Rot and decay at top of fender piles.
c) Loose fender pile straps.
d) Snag hazard due to loose mooring lines.

Pier 2

a) Falling debris hazard due to loose and damaged concrete of the pier deck and the top of deck (Photos 9, 12, and 13)
b) Snag hazard due to loose mooring lines (Photos 9 and 10).
c) Unprotected end of exposed reinforcing steel (Photo 11).
d) Loose fender pile straps.
e) It is not known if stub of missing piles exist above mud line.

Pier 3

a) Rot and decay at top of fender piles.
b) Loose fender pile straps.
c) It is not known if stub of missing piles exist above mud line.
d) Snag hazard due to loose mooring lines.

Pier 4

a) Rot and decay at top of fender pile.
b) Loose fender pile straps.
c) It is not known if stub of missing piles exist above mud line.
d) Snag hazard due to loose mooring lines.
e) Hanging Steel Rod in board of west pile cap (Photo 20).

Pier 5

a) Rot and decay at top of fender piles.
b) Loose fender pile straps.
c) It is not known if stub of missing piles exist above mud line.
d) Snag hazard due to loose mooring lines.

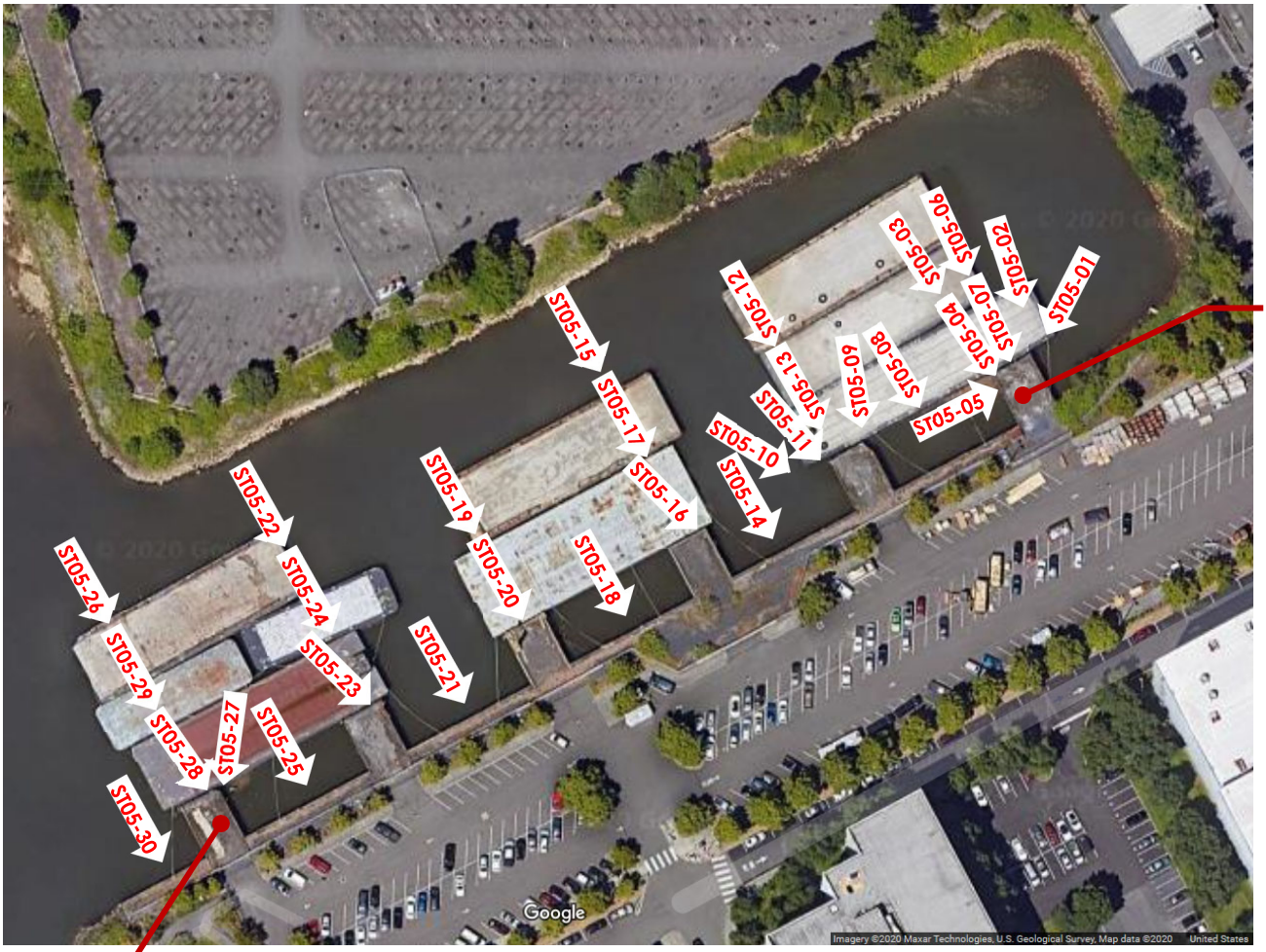
Pier 6

a) Damaged concrete pier deck with exposed reinforcing steel and unprotected ends.
b) Rot and decay at top of fender piles.
c) Loose fender pile straps.
d) It is not known if stub of missing piles exist above mud line.
e) Snag hazard due to loose mooring lines.

Wharves

a) Snag hazard due to loose mooring lines.

VICINITY MAP



PHOTOGRAPHS

Photo ST05-01: Pier 1, East Most (Looking Southwest)

Photo ST05-02: Pier 1 (Looking South)

PHOTOGRAPHS

Photo ST05-03: Pier 1, East Side of West Pile Cap

Photo ST05-04: Pier 1, East Side of West Pile Cap

PHOTOGRAPHS

aPhoto ST05-05: Pier 1, West Side of West Pile Cap

Photo ST05-06: Pier 1, Pier Deck Soffit

PHOTOGRAPHS

Photo ST05-07: Close Up of Exposed Reinforcing Bar

Photo ST05-08: Wharf Between Pier 1 and 2

PHOTOGRAPHS

Photo ST05-09: Pier 2

Photo ST05-10: Pier 2 (Looking Southeast)

PHOTOGRAPHS

Photo ST05-11: Pier 2, West Cap Beam

Photo ST05-12: Pier 2, Top West Corner of 1st Deck Panel

PHOTOGRAPHS

Photo ST05-13: Pier 2, Close Up of West Corner of 1st Deck Panel

Photo ST05-14: Wharf Between Pier 2 and Pier 3

PHOTOGRAPHS

Photo ST05-15: Pier 3

Photo ST05-16: Pier 3, East Pile Cap

PHOTOGRAPHS

Photo ST05-17: Pier 3, Pier Deck Soffit

Photo ST05-18: Wharf Between Pier 3 and Pier 4

PHOTOGRAPHS

Photo ST05-19: Pier 4

Photo ST05-20: Pier 4, Pier Deck Soffit

PHOTOGRAPHS

Photo ST05-21: Wharf Between Pier 4 and Pier 5

Photo ST05-22: Pier 5

PHOTOGRAPHS

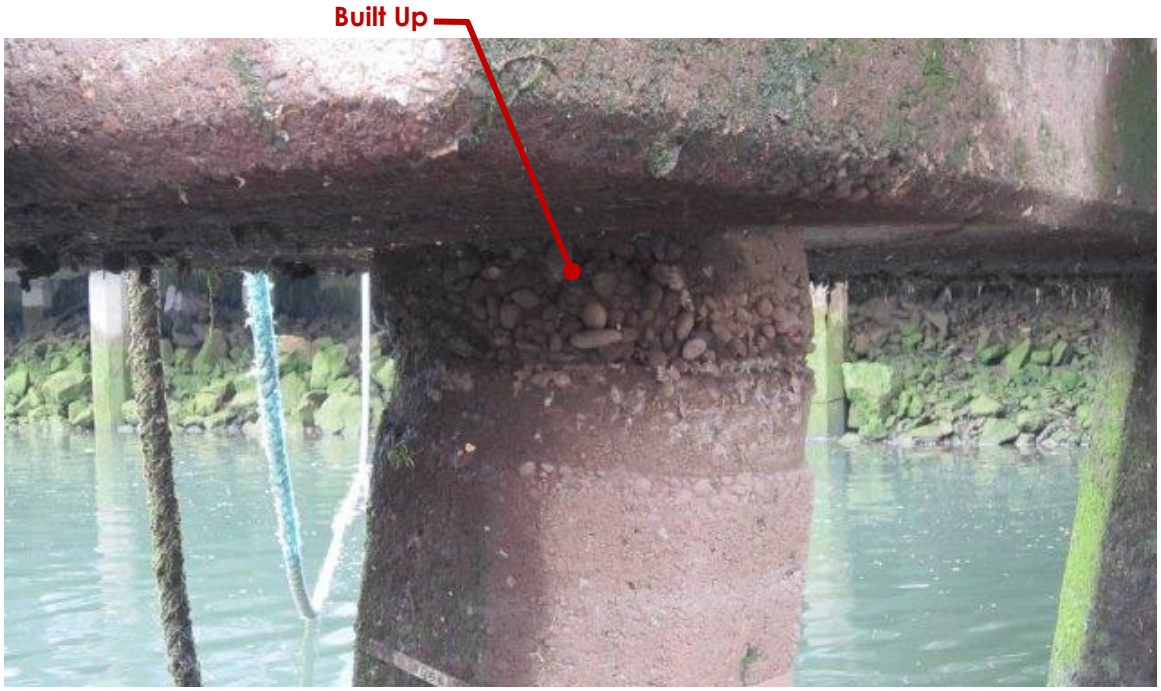


Photo ST05-23: Pier 5, Bent 1 East Cap Beam

Photo ST05-24: Pier 5, Pier Deck Soffit

PHOTOGRAPHS

Photo ST05-25: Wharf Between Pier 5 and Pier 6

Photo ST05-26: Pier 6

PHOTOGRAPHS

Photo ST05-27: Pier 6, East Side

Photo ST05-28: Pier 6, East Pile Cap

PHOTOGRAPHS

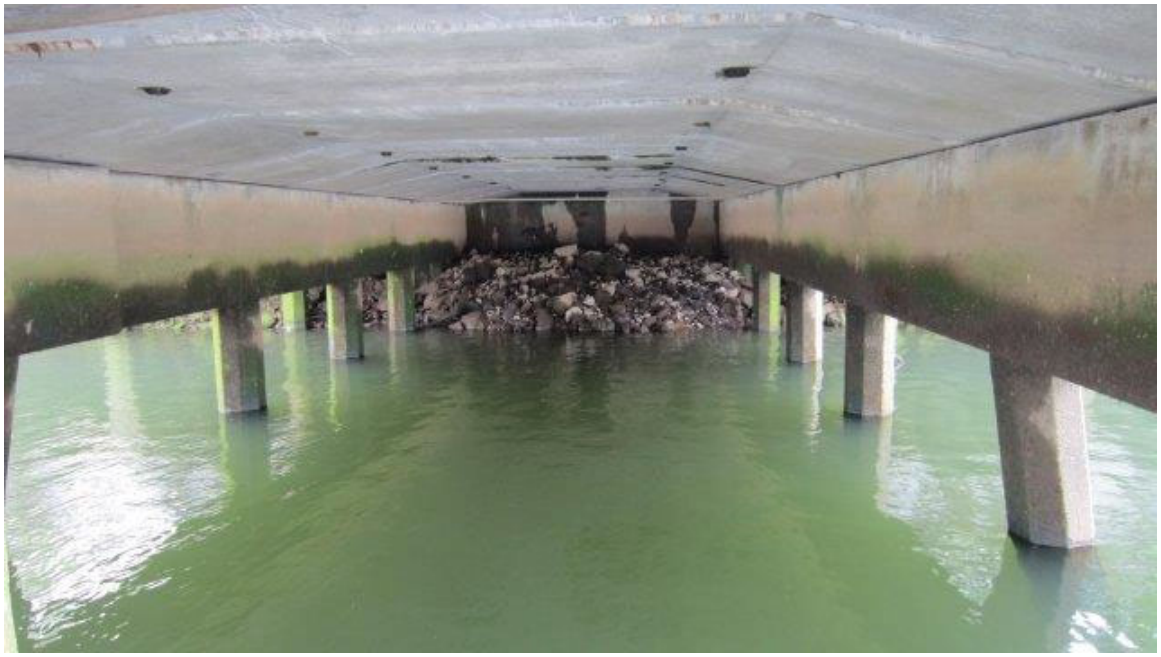


Photo ST05-29: Pier 6, Pier Deck Soffit

Photo ST05-30: Wharf West of Pier 6

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST05 – The Boeing Company Seattle Wharf, 4.2 – East

Inspection Date: June 15, 2020
July 12, 2021
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants		Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	X
Cracking	X
Scaling	X
Spalls, pop outs, and delamination	X
Stains, Efflorescence	X
Exposed Reinforcement: Corrosion	X
Damage or distress	X
Missing or broken members	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	X
Curling and warping	X
Erosion	X
Previous Patching or Other Repair:	X
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	X
Exposed Aggregate	X
Leaks through Walls	
Structural Defects	X
Moss	X

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST05 – The Boeing Company Seattle Wharf, 4.2 – East

Inspection Date: June 15, 2020
July 12, 2021
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor	X	Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	X
Fasteners: Corrosion	X
Soft timber and decay	X
Abrasion	X
Previous Repair	X
Surface Coatings, Protective Systems	X
Debris Buildup	X
Structural Defects	X
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST07
Timber Groins and Wharf
Parcel No. N/A

WUS#: 66

Facility Location: River Mile 4.5

Direction (side) East

STA 359+00 to STA 374+00

Asset Type: Timber Groins and Wharf

Use: Wharf, Groin

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas. Physical measurements or close up observations were collected where possilble.

The structure consists of:

- Concrete apron supported on timber piers (Photo 1).
- Two wharfs consisting of concrete aprons and braced timber pile supports (Photos 2 to 5).
- Several rows of closely spaced timber pile groins and bulkhead (Photos 6 to 15).
- All of the pile groins are covered by moss and the tops appear to be rotted. A close inspection for soundness was conducted on a few piles. A 1/8" spike penetration was measured around the tidal section of the pile indicating soundness. The offshore or end piles appear to exhibit most damage (Photos 6 to 10).

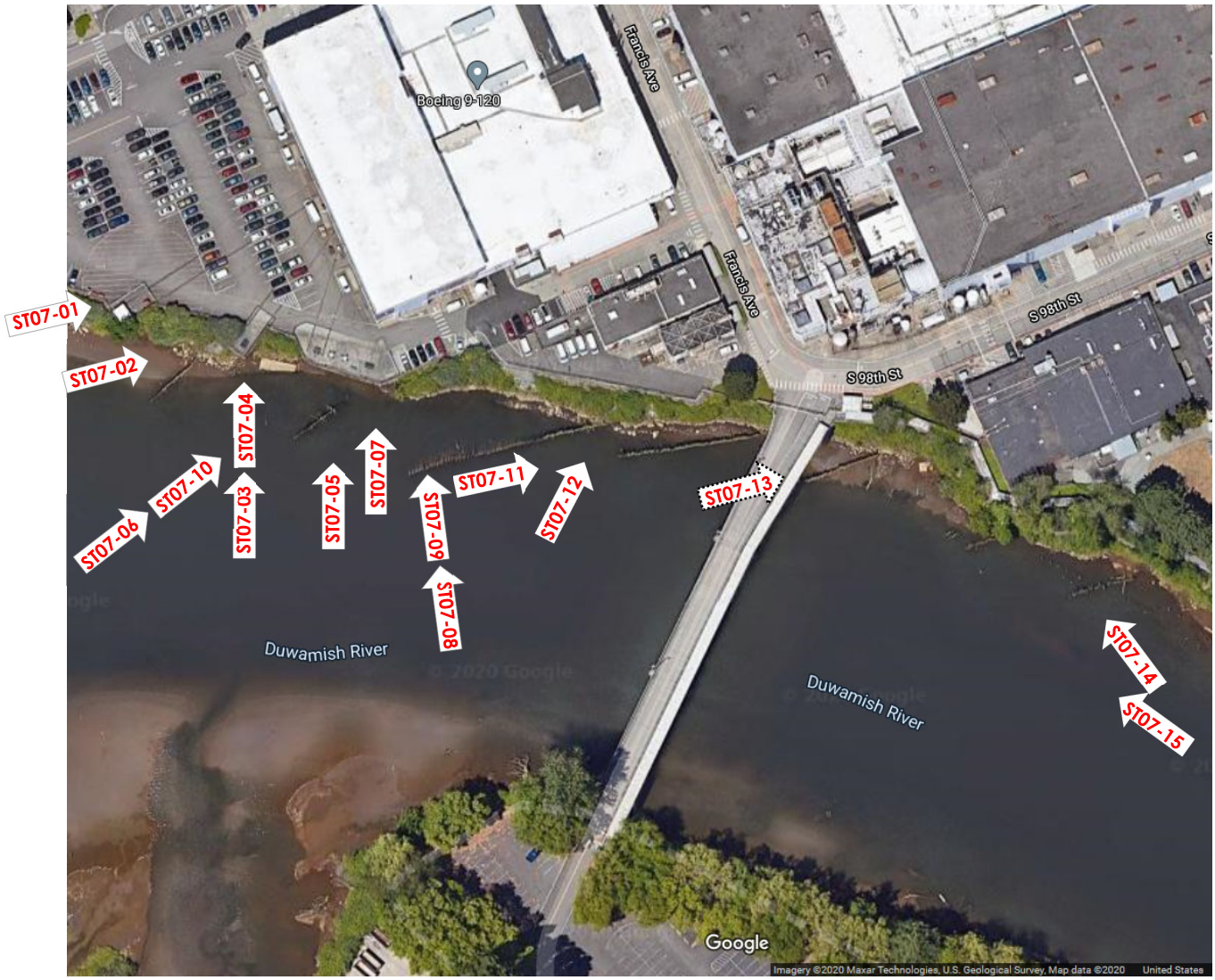
Accessibility:

- The pile groins are closely spaced; however, areas between the rows of pile groins are accessible.
- Limited accessibility to areas under the wharf.

Potential Hazards:

- Condition of the piles above and below mudline could not be determined.
- Condition of the pile and pier supports under the wharf could not be determined.

VICINITY MAP



PHOTOGRAPHS

Photo ST07-01: North–most Structure (Down Stream Looking East)

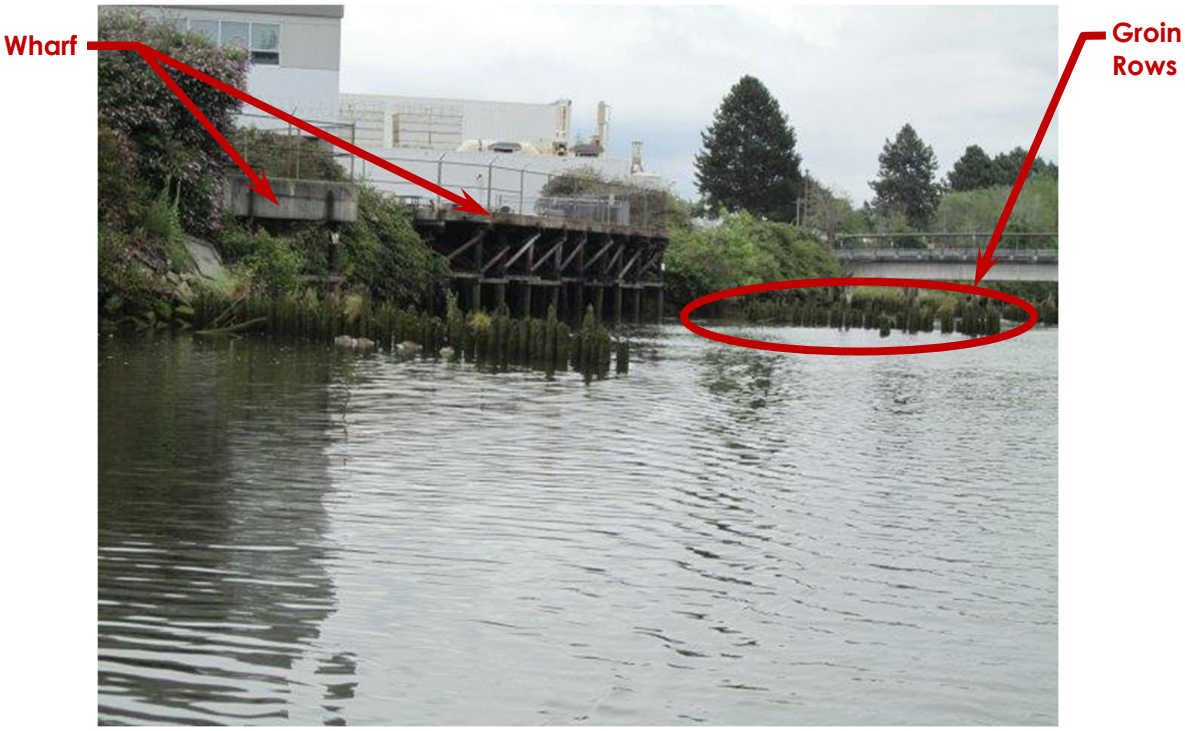


Photo ST07-02: Wharfs (Looking East)

PHOTOGRAPHS

Photo ST07-03: Smaller Wharf at High Tide

Photo ST07-04: Smaller Wharf at Low Tide

PHOTOGRAPHS

Photo ST07-05: Larger Wharf at High Tide

Photo ST07-06: Larger Wharf at Low Tide

PHOTOGRAPHS

Photo ST07-07: Timber Bulkhead

Photo ST07-08: Groin Piles

PHOTOGRAPHS

Photo ST07-09: Interior Groin Piles

Photo ST07-10: End Pile

PHOTOGRAPHS

Photo ST07-11: Groins North of Bridge (Looking Southeast)

Photo ST07-12: Groins and Embankments North of Bridge

PHOTOGRAPHS

Photo ST07-13: Groins and Embankment South of Bridge

Photo ST07-14: Groins and Embankment South of Bridge

PHOTOGRAPHS

Photo ST07-15: Groins and Embankment South of Bridge (Looking Northeast)

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST07 – Timber Groins and Wharf, 4.5 - East

Inspection Date: July 17, 2020
July 12, 2021
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants		Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

	Cracking or Breakage
	Staining
	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	
Cracking	
Scaling	
Spalls, pop outs, and delamination	
Stains, Efflorescence	
Exposed Reinforcement: Corrosion	
Damage or distress	
Missing or broken members	
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Curling and warping	
Erosion	
Previous Patching or Other Repair:	
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	
Exposed Aggregate	
Leaks through Walls	
Structural Defects	
Moss	

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST07 – Timber Groins and Wharf, 4.5 - East

Inspection Date: July 17, 2020
July 12, 2021
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor	X	Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	X
Soft timber and decay	X
Abrasion	X
Previous Repair	X
Surface Coatings, Protective Systems	
Debris Buildup	X
Structural Defects	
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/07/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST08
S 98th Street (Boeing) Bridge
Parcel No. N/A

WUS#: 66

Facility Location: River Mile 4.8

Direction (side) Both

STA 370+00 to STA 391+00

Site Overview

Asset Type: Concrete Bridge

Use: Vehicular Bridge

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were collected.

The structure consists of:

- Three (3)-span concrete girder bridge (Photo 1).
- East and west concrete abutments protected with riprap (Photos 2 and 3).
- Two (2) bents in the navigational channel each consisting of seven (7) steel piers and concrete cap beam (Photos 4 and 5).
- The concrete surface of the abutments and girders appears to be in good condition (Photos 2 to 4).
- The surface of the steel piers exhibits scattered rust and corrosion (Photos 4 and 5).
- Approximately 12-ft vertical clearance at center spans (1:55pm, July 17, 2020 tide level)

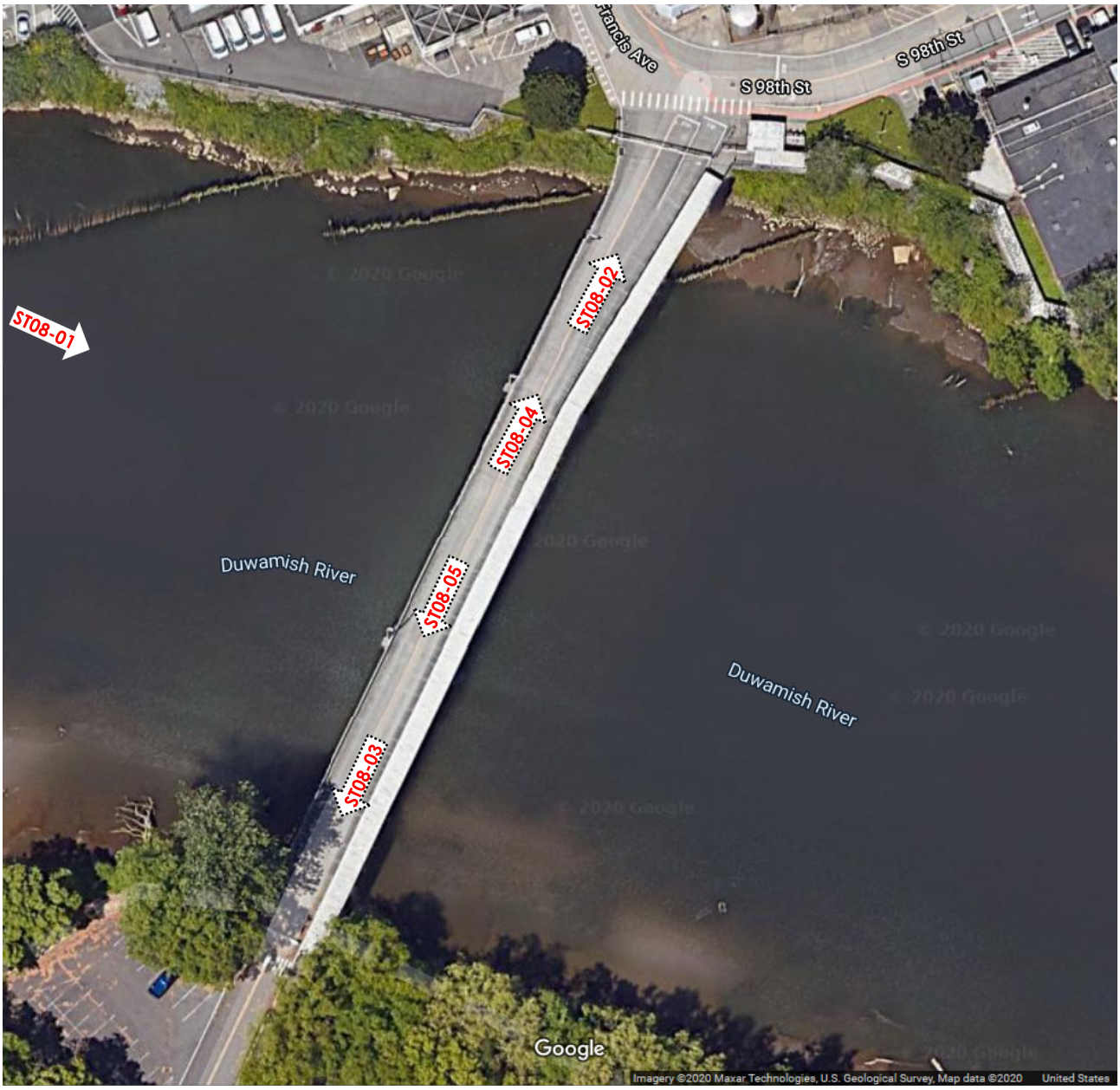
Accessibility:

- Accessibility may be limited in areas outside the navigable channel (between the piers and abutments).

Potential Hazards:

- Vessel clearance outside the navigable channel.

VICINITY MAP



PHOTOGRAPHS

Photo ST08-01: Bridge (Looking South)

Photo ST08-02: East Abutment

PHOTOGRAPHS

Photo ST08-03: West Abutment

Photo ST08-04: East Bent (Looking East)

PHOTOGRAPHS

Photo ST08-05: West Bent (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST10
Miscellaneous Piles-1
Parcel No. N/A

WUS#: None

Facility Location: River Mile 4.7

Direction (side) West

STA 411+00

Site Overview

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were collected.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photo 1).

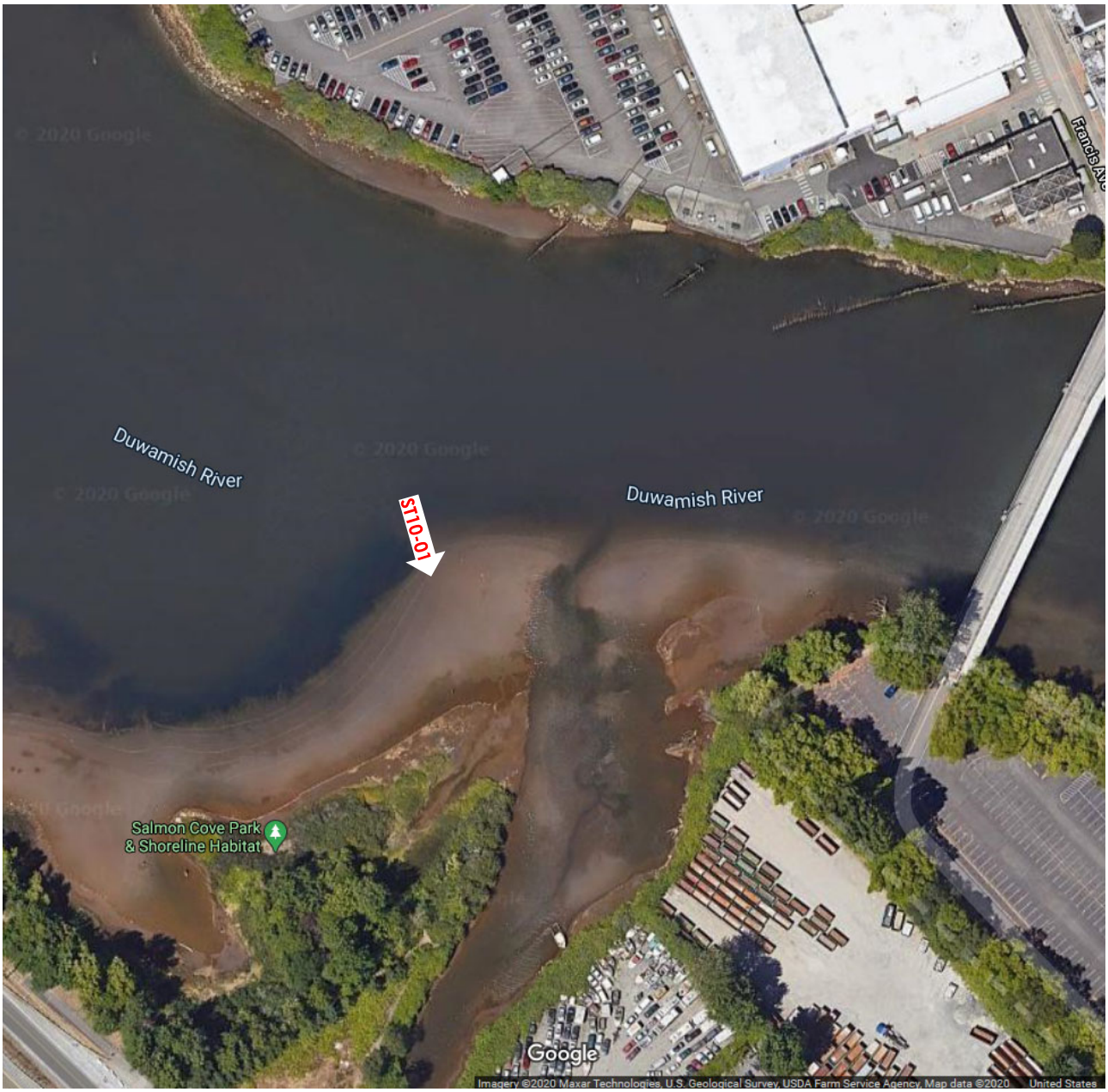
Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS

Photo ST10-01: Piles

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST10 – Miscellaneous Piles-1, 4.7 - West

Inspection Date: July 17, 2020
July 12, 2021
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST12
Delta Marine Industries
Parcel No. 5624200005

WUS#: 43

Facility Location: River Mile 4.1

Direction (side) West

STA 446+00 to STA 454+00

Asset Type: Wharf – Concrete Finger Piers

Use: Vessel manufacturing, mooring vessels for outfitting and repairs

Inspection Date: June 15, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. Some physical measurements were taken at this site.

The structure consists of:

a) Two (2) finger piers to the south that each comprise of:
   - Two (2) rows of seven (7) bents of 30" diameter steel pipe piles (one now vertical and the other battered). (Photos 1 and 2)
   - Concrete pile cap – Approximately 24"deep x 48"wide, 22-ft on center. (Photos 3 and 4)
   - Precast concrete haunched pier decks (two wide per bent). (Photo 5)

b) A floating dock supported with five (5) steel pipe guide piles, a floating walkway to the west support with four (4) timber guide piles, and an aluminum gangway that leads to the apron/wharf. (Photos 6 to 8)

c) Steel sheet pile bulkhead with concrete pile cap along the south return and, along the wharf, up to the north finger pier. (Photos 1, 2 and 9)

d) Steel H-pile bulkhead with precast concrete panel lagging and steel cap from the north pier, along the wharf, to the north end. H-Piles are about 8-ft on center. (Photos 8 to 14)

e) Steel sheet pile bulkhead along the north return. (Photo 14)

f) Breakwater/debris deflector at north end adjacent to the Duwamish Yacht Club. (Photo 15)

g) A three (3) steel pipe guide pipe and supporting debris deflection steel pipe float. Located up stream of the south finger pier. (Photo 16)

General

- The steel pipes are in good condition.

- Concrete pile cap and pier decks are in good condition.
- The surface of the floating dock guide piles and gangway were not inspected during the site visit.
- Coating loss and surface rust corrosion was observed on the bulkhead, the H-piles, and steel accessories. Generally in good condition.
- The surfaces of the concrete panel are in good condition except a few scatted cracks, minor spalls, and moss growth.
- The guide piles and debris deflector were not closely observed.

Accessibility:

- Maximum vertical clearance under the pier deck is about 13-ft at 1.5-ft tide level.
- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- The finger piers appear to be accessible between the bents and outboard along the piers. Accessibility between the bents near the bulkhead may also depend on the river bed profile.
- The floating dock is accessible on all sides except when large vessels are moored at the float or at the wharf.
- Access along the east and north bulkhead is unrestricted except when the vessel is moored along the wharf.
- The debris deflection structure is accessible from both sides.

Potental Hazards:

- There are no overhead structures near the finger piers except the gangway.
- Along the east and north bulkhead, there are no overhead structures except the gangway and boat lift equipment.
- There are no overhead structures near the debris deflection structure.

VICINITY MAP

PHOTOGRAPHS

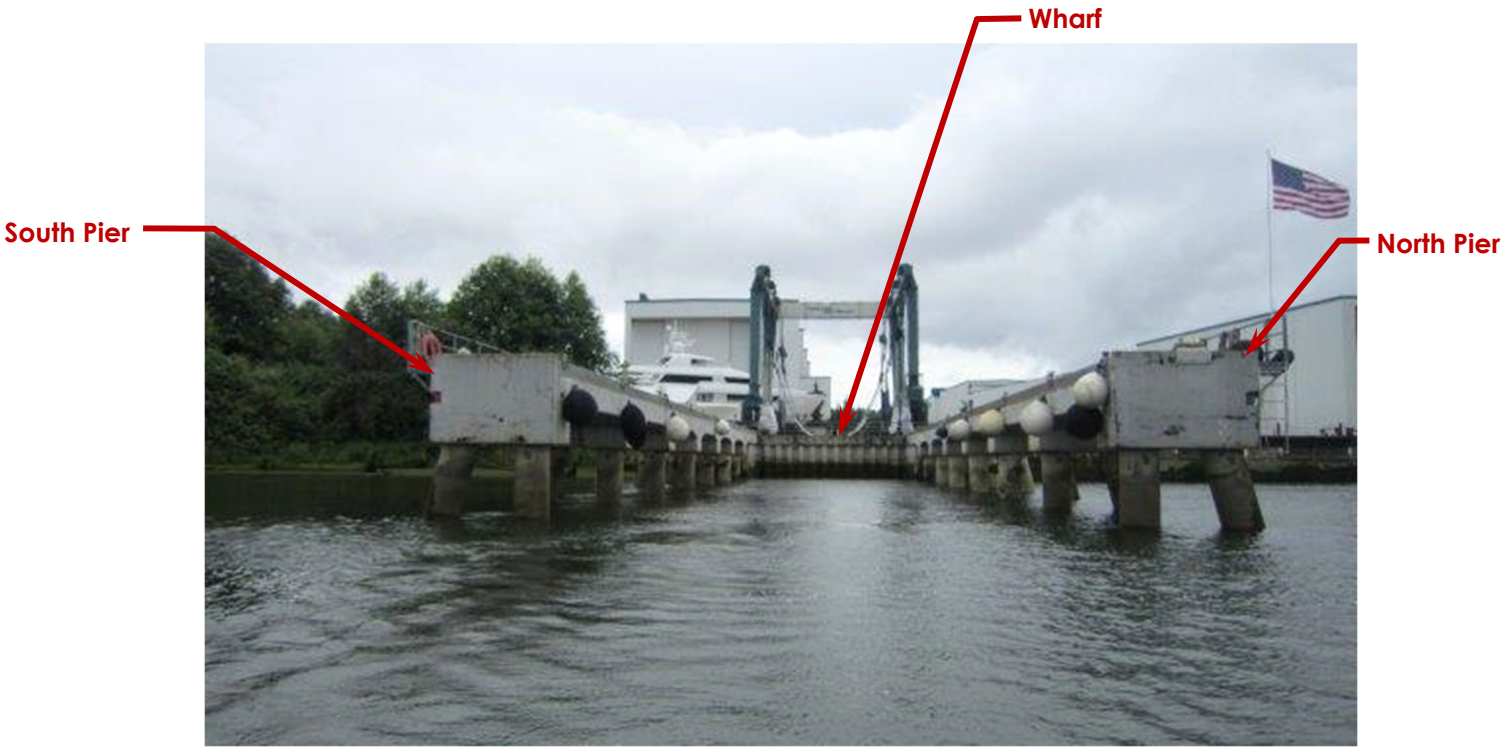


Photo ST12-01: Dock Fairway (Looking West)

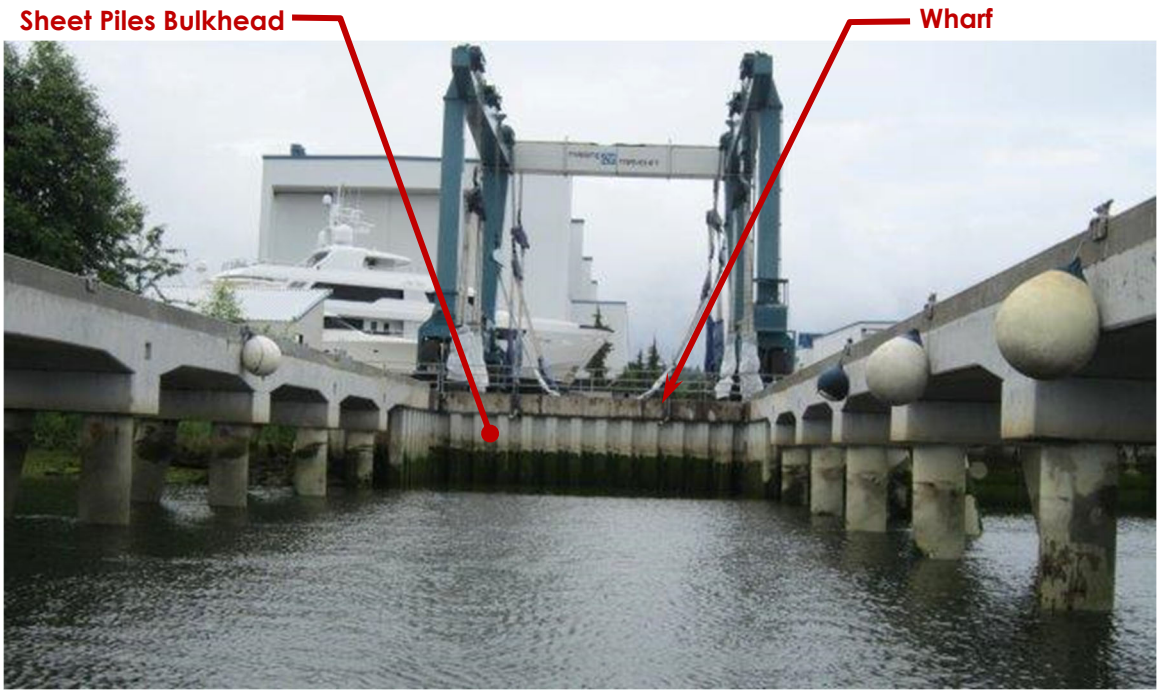


Photo ST12-02: Finger Piers (Looking West)

PHOTOGRAPHS

Photo ST12-03: East End Piles and Caps of South Finger Pier

Photo ST12-04: South Pier Pile Rows (Looking West)

PHOTOGRAPHS

Photo ST12-05: Pile Cap and Pier Decks (Looking West)

Photo ST12-06: Floating Dock Access Way (Looking North)

PHOTOGRAPHS

Photo ST12-07: Floating Dock

Photo ST12-08: Bulkhead Among Wharf

PHOTOGRAPHS

Photo ST12-09: Bulkhead

Photo ST12-10: H-Pile Bulkhead (Looking North)

PHOTOGRAPHS

Photo ST12-11: Close Up of H-Pile Bulkhead

Photo ST12-12: North End Bulkhead and Return (Looking West)

PHOTOGRAPHS

Photo ST12-13: North End Close Up of the H-Pile Bulkhead

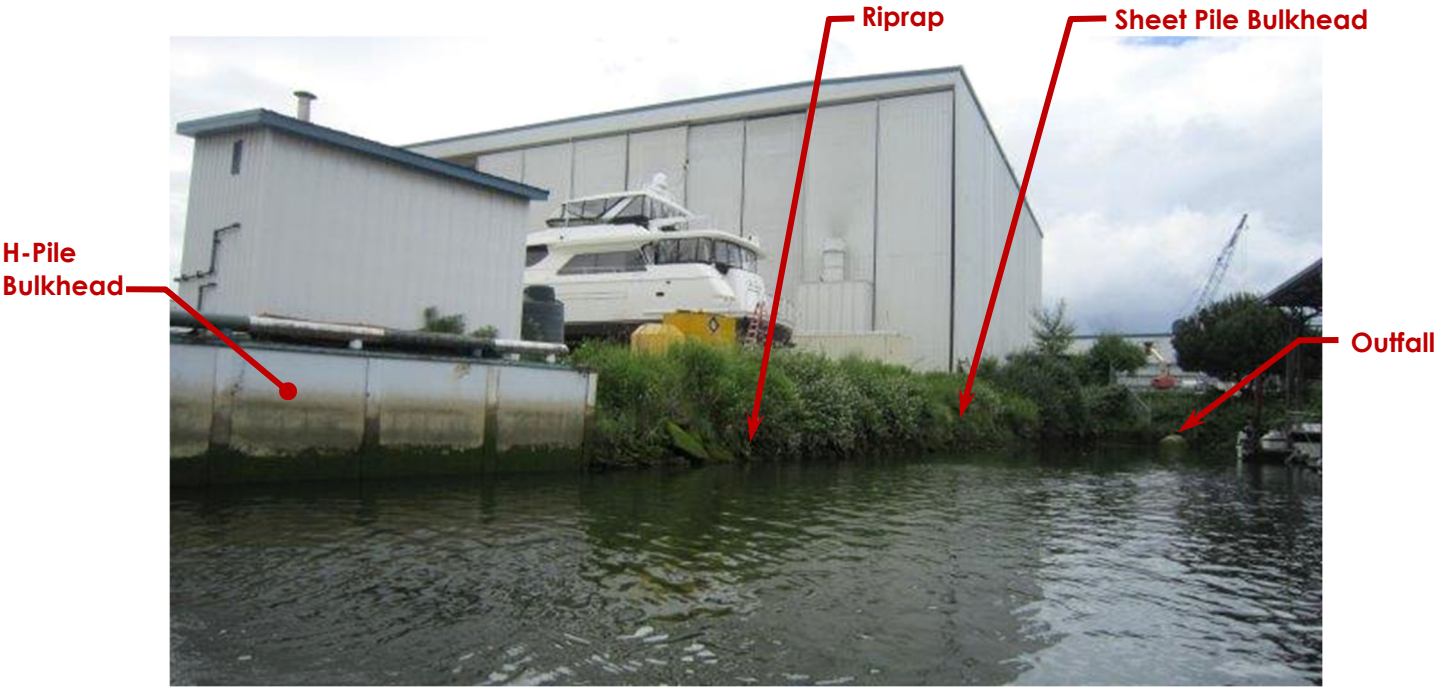


Photo ST12-014: Upstream North Bulkhead

PHOTOGRAPHS

Photo ST12-15: Breakwater

Photo ST12-016: Upstream Debris Deflector

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST12 - Delta Marine Industries, 4.2 - West

Inspection Date: June 15, 2020
July 12, 2021
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants		Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

	Cracking or Breakage
	Staining
	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Scaling	X
Spalls, pop outs, and delamination	X
Stains, Efflorescence	X
Exposed Reinforcement: Corrosion	X
Damage or distress	X
Missing or broken members	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	X
Curling and warping	X
Erosion	X
Previous Patching or Other Repair:	X
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	X
Exposed Aggregate	X
Leaks through Walls	
Structural Defects	X
Moss	X

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST12 - Delta Marine Industries, 4.2 - West

Inspection Date: June 15, 2020
July 12, 2021
Prepared By: Ade Bright

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

	Member cracking or breakage
	Staining, corrosion
	Surface deposits
	Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	
Rust and scale	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Stains	X
Corrosion	X
Abrasion	X
Previous Repair	X
Surface Coatings	X
Debris Buildup	X
Structural Defects	X
Moss	X

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST12 - Delta Marine Industries, 4.2 - West

Inspection Date: June 15, 2020
July 12, 2021
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	X
Fasteners: Corrosion	X
Soft timber and decay	X
Abrasion	X
Previous Repair	X
Surface Coatings, Protective Systems	X
Debris Buildup	X
Structural Defects	X
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/07/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST16
Kelly Ryan (formerly McElroy George and Associates, Inc.)
Parcel No. 1600060

WUS#: 40

Facility Location: River Mile 4.0

Direction (side) West

STA 464+00 to STA 466+10

Site Overview

Asset Type: Concrete Finger Piers

Use: Vessel Moorage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were collected on the deck at this site.

Structure consists of four (4) connected finger piers (Photo 1). Each pier is approximately 20-ft wide x 36-ft long(in the east-west direction) and composed of:

- Five (5) rows of six (6) octagonal prestressed concrete pile bents. Piles on the 2nd and 5th bents are battered, the others are vertical.
- Five (5) rows of 34-in wide x 18-in deep concrete pile caps.
- Six (6) precast concrete haunched pier decks.
- Sets of two (2) timber fender piles at each pile cap and at mid-span of the pier decks.
- Steel sheet pile bulkhead.

Timber Fender Piles

- Majority of the fender piles are missing, broken, damaged, or in poor condition. Most pile straps are either missing or broken (Photos 2 to 5).

Concrete Piles

- The concrete piles appear to be in good condition except surface mortar erosion and moss growth in the wet/dry zone of the piles (Photos 6 and 7).
- There is a significant loss of concrete on the south face of the pile at Bent 4, Row 2. No exposed reinforcing or rust stains were observed (Photo 8).
- Approximately 12-in of the pile at Bent 2, Row 4 appears to be field built-up (Photo 9).

Concrete Caps

- The concrete surfaces of the pile caps appear to be in good condition. No cracks, spalls, or significant chips were observed (Photos 7 to 11).

Concrete Pier Decks

- Spall at the east face of both Pier 3 and Pier 4 decks. No exposed reinforcing or rust stains were observed (Photos 12 and 13).
- The concrete surface of the pier deck soffits appear to be in good condition (Photos 14 and 16).

Bulkhead

- A close observation of the steel sheet pile and concrete cap was not possible. There appears to be moss growth and rust in the wet/dry zone of the sheet pile (Photos 7, 10, 12, 14, and 15).

Accessibility:

- Accessibility to the structure depends on vessel size, height, draft, and tide level.
- The structure is accessible on the south and north sides. Access on the east side is obstructed by the fender piles.

Potental Hazards:

- Loose fender pile straps.
- Numerous piles are badly damaged, decayed, and/or unsound.

VICINITY MAP

PHOTOGRAPHS

Photo ST16-01: Pier Configuration

Photo ST16-02: Piers 2 to 4 (Looking Northwest)

PHOTOGRAPHS

Photo ST16-03: Piers 3 and 4

Photo ST16-04: Fender Pile

PHOTOGRAPHS

Photo ST16-05: Fender Pile

Photo ST16-06: Concrete Piles

PHOTOGRAPHS

Photo ST16-07: Concrete Piles (Looking Southwest)

Photo ST16-08: Concrete Pile

PHOTOGRAPHS

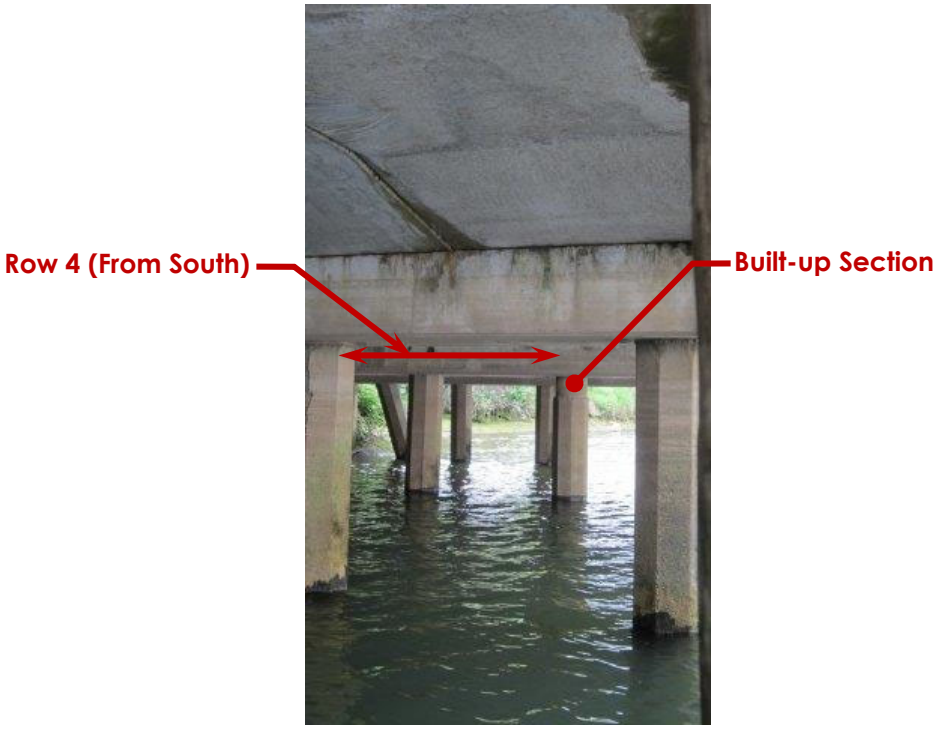


Photo ST16-09: Pile and Pilecaps

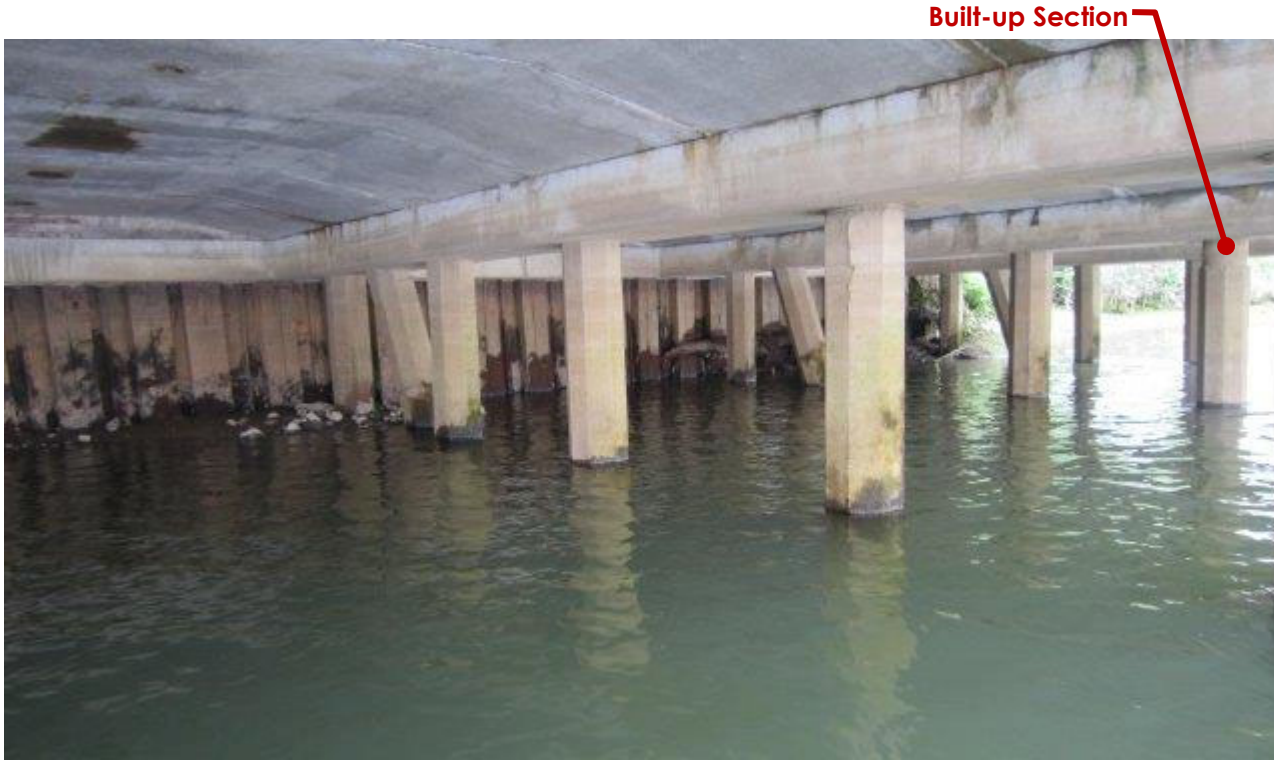


Photo ST16-10: Piles and Pile Caps (Looking Northwest)

PHOTOGRAPHS

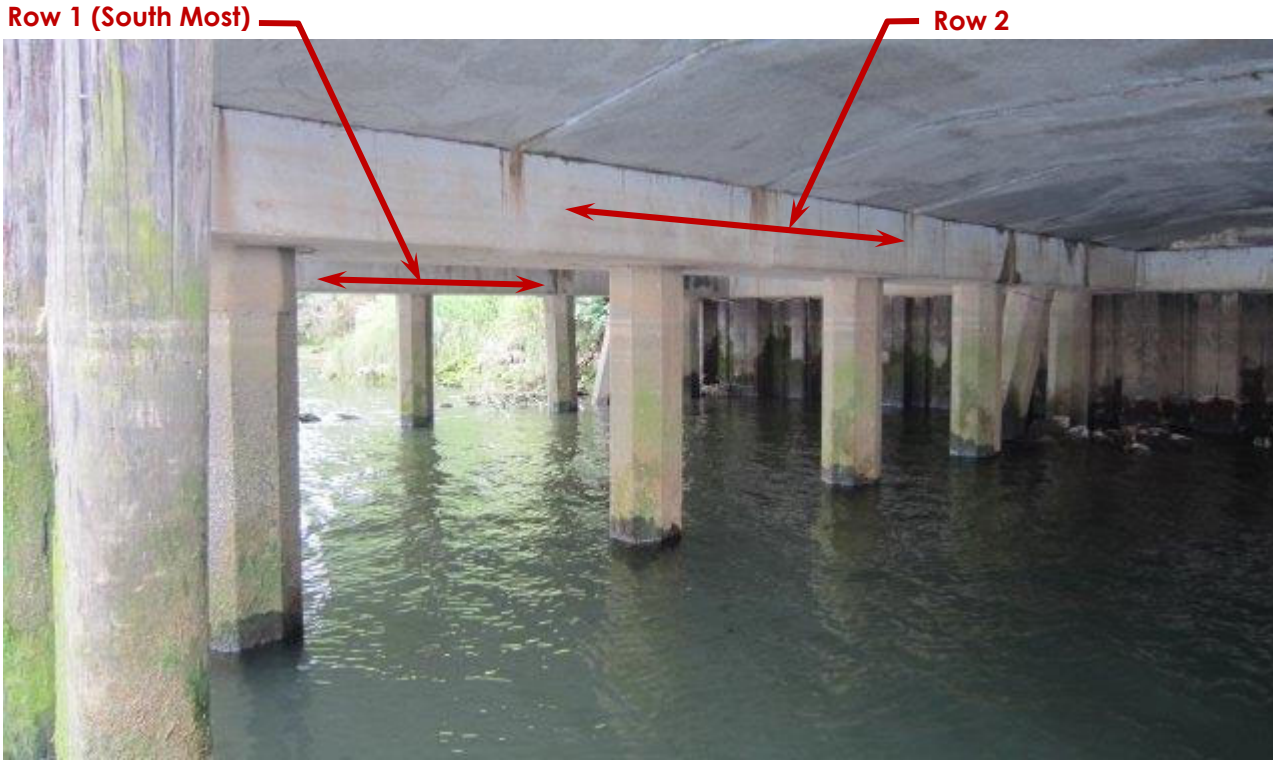


Photo ST16-11: Piles and Pile Caps (Looking Southwest)

Photo ST16-12: Pier 3 Pier Deck

PHOTOGRAPHS

Photo ST16-13: Pier 4 Pier Deck

Photo ST16-014: Bulkhead and Pier Deck Soffit (Looking West)

PHOTOGRAPHS

Photo ST16-15: Pier Deck Soffit

Photo ST16-016: Pier 4 Pier Deck (North Most, Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

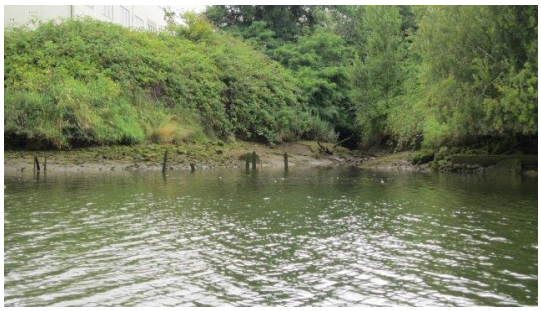
Facility Name: ST17
Miscellaneous Piles-3
Parcel No. N/A

WUS#: None

Facility Location: River Mile 3.9

Direction (side) West

STA 468+00 to STA 471+50



Site Overview

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the west shoreline. They appear to have been cut down and are in poor condition (Photo 1).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP

PHOTOGRAPHS

Photo ST17-01: Pile Field

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST17 – Miscellaneous Piles-3, 3.9 - West

Inspection Date: July 17, 2020
July 12, 2021
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST19
Terminal 117 Cleanup Site
Parcel No. N/A

WUS#: 39

Facility Location: River Mile 3.5

Direction (side) West

STA 483+50 to STA 492+40

Asset Type: Steel Sheet Pipe Bulkhead

Use: Cleanup Containment

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☒ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were done at this site.

General

- Structure consists of U-shaped steel sheet pile bulkhead for contamination containment of Terminal 117 Cleaup Site.
- The sheet piles appear to be in good condition. (Photos 1 to 4)
- The North and South return walls abut riprap river bank embankment. (Photos 1 to 4)
- Near the north end of the bulkhead, four (4) 12" diamerter steel pipe guide piles support for a 16" diameter float debris deflection pile pipe. The piles and float are in good condition. (Photos 2 and 3)
- During the July 12, 2021 inspection we observed, under construction, what appears to be an elevated concrete walkway deck supported by steel pipe piers. (Photo 5)
- The walkway is in-water, along the west shoreline and south of the South Park Marina.

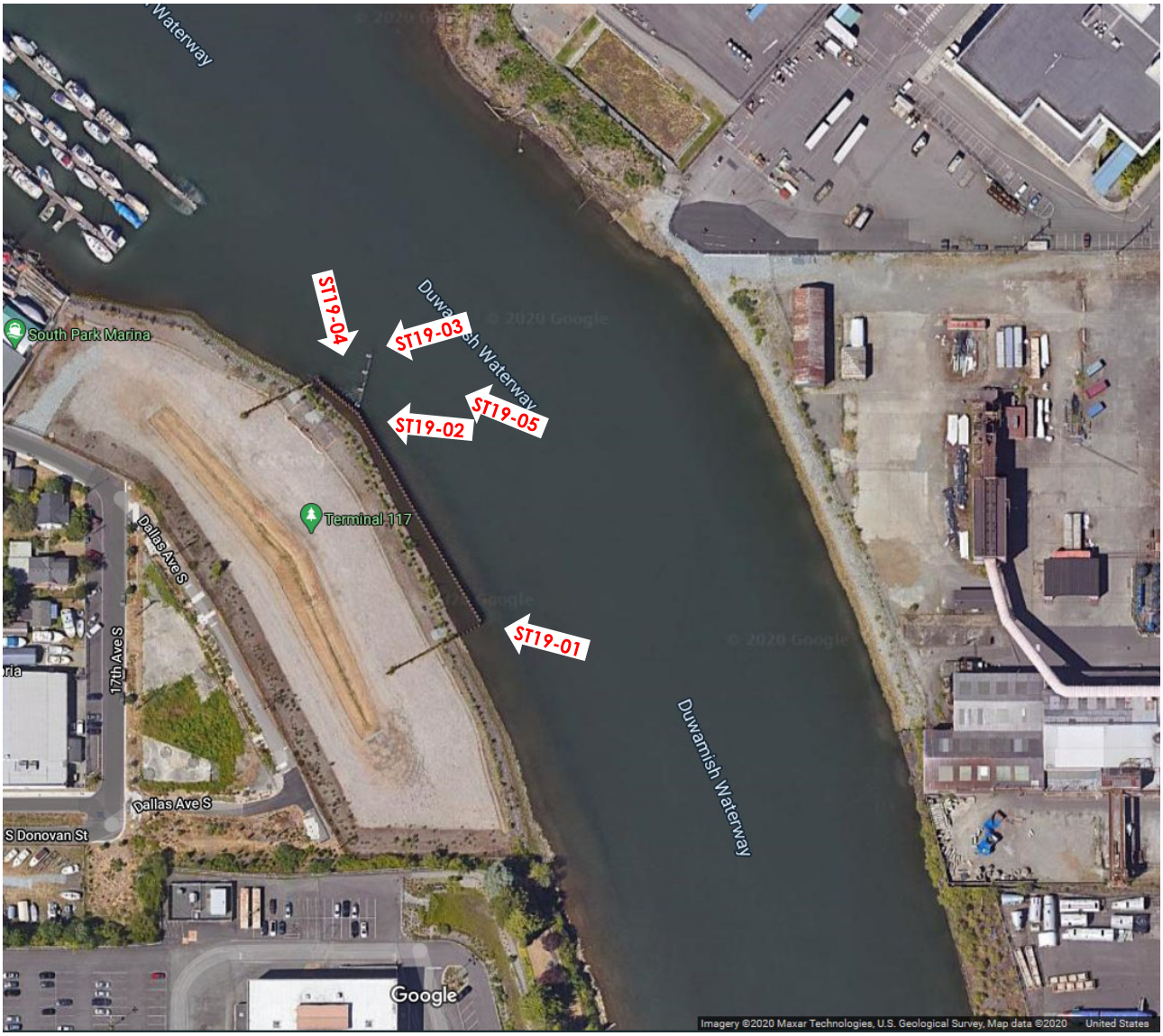
Accessibility:

- Accessibility to the structure depends on inspection vessel size, height, draft, and tide level.
- The east side and parts of the north and south bulkhead are accessible by boat; the remaining portion of the north and south bulkhead is accessible by land.
- The debris deflection structure is accessible on both sides.
- The extent or limits of the walkway under construction is not currently known.

Potential Hazards:

- There are no overhead structures observed near the bulkhead.
- There are no overhead structures observed near the debris deflection structure.
- The extent or limits of the walkway under construction is not currently known.

VICINITY MAP



PHOTOGRAPHS

Photo ST19-01: South Return Wall (Looking Northwest)

Photo ST19-02: Debris Deflector Float (Looking Northwest)

PHOTOGRAPHS

Photo ST19-03: Debris Deflector Float (Looking Northwest)

Photo ST19-04: North Return Wall (Looking West)

PHOTOGRAPHS

Photo ST19-05

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST19 – Terminal 117 Cleanup Site, 3.6 - West

Inspection Date: July 17, 2020
July 12, 2021
Evaluation By: Ade Bright

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
	Abrasion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

	Member cracking or breakage
X	Staining, corrosion
	Surface deposits
	Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	
Rust and scale	
Loss of Material	X
Missing or broken members	
Damage or distress	
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Stains	X
Corrosion	
Abrasion	
Previous Repair	
Surface Coatings	
Debris Buildup	
Structural Defects	
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: ST20
South Park Marina
Parcel No. 2185600070

WUS#: 39

Facility Location: River Mile 3.3

Direction (side) West

STA 4+91 to STA 4+99.50

Site Overview

Asset Type: Marina

Use: Moorage of commercial and recreational vessels

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection of in-water structures was conducted from the water side and during low and high tides. Observations and field measurements are limited to boat accessible areas and on the floats.

The Marina consists of:

- A bulkhead along the west bank
- Gangway leading to the docks
- A primary floating walkway
- Three (3) parallel floating docks on the south and north sides of the primary walkway
- Finger piers on the west side of the west-most dock
- Timber guide piles; steel guide piles at the south ends of the south floating docks
- A boat ramp

Bulkhead

- The embankment consist of gravity concrete blocks (ecology type blocks) along the upper slope and rip rap along the toe of the slope. The wall apprears to be four (4) blocks high (exposed height). The number of blocks below grade is unknown (Photos 1 to 6).
- There is evidence of significant ground settlement and lateral deflection along the entire length of the wall (Photos 2 to 8).
- At the north end, south of the boat ramp is a short length of lower gravity block wall which appear to be one (1) block high (Photo 7).

- The boat ramp is retained by gravity concrete block on the south side and concrete panels on the noth side (Photos 7 and 8).

Gangway

- The galvanized steel pipe truss gangway is supported on the west end but the type and condition of the support is unknown (Photo 9).
- Utilities servicing the marina are hung on the west end of the gangway and fed from under the gangway. The integrity of the pull box cantenary supports is not known (Photos 10 and 11).
- There is scattered rust along the length of the truss members and corrosion at several welded joints (Photos 10 and 11).
- The wood walkway decking is worn and weathered but not distress was observed.
- The slip resistant grating over the decking appears to be in good condition.

Floating Docks

- The walkway, docks, and finger piers timber decking are worn and weathered. A number of planks appear to have been replaced, missing, re-fastened. Except for scattedered dead or lost knots and checks no evidence of rot, moss growth, splinters, or perceptible deflection was observed (Photos 12 to 19).
- Utilities on the dock include power, water, and cable (Photo 14 and 15).

Float Guide

- The timber guide piles and preservative treatment appear to be sound in good condition except for moss build up around the splash zone (Photos 16 to 18).
- The pile guides appear to be of different configurations. Damage consists of broken members, missing members, and abrasion (Photos 16 to 19).
- The steel guide piles appear to be newer than the timber piles. They are in good condition (Photo 19).

Accessibility:

- Accessibility depends on vessel size, draft, and tide level.
- The floating docks are accessible on all sides.
- The bulkhead and gangway are accessible from the land and water sides.

Potental Hazards:

- There are no overhead structures except for the gangway.
- The bulkhead appears to be generally unstable
- The condition or type of support or bulkhead under the gangway is unknown.

VICINITY MAP

***** Photos ST20-14 to ST020-19 can be found in various locations on the structure.

PHOTOGRAPHS

Photo ST20-01: Retaining Wall Bulkhead (Looking Northwest)

Photo ST20-02: Retaining Wall Bulkhead (Looking South West)

PHOTOGRAPHS

Photo ST20-03: Retaining Wall (Looking North)

Photo ST20-04: Retaining Wall Bulkhead (Looking North)

PHOTOGRAPHS

Photo ST20-05: Close Up of Chain Tie Back

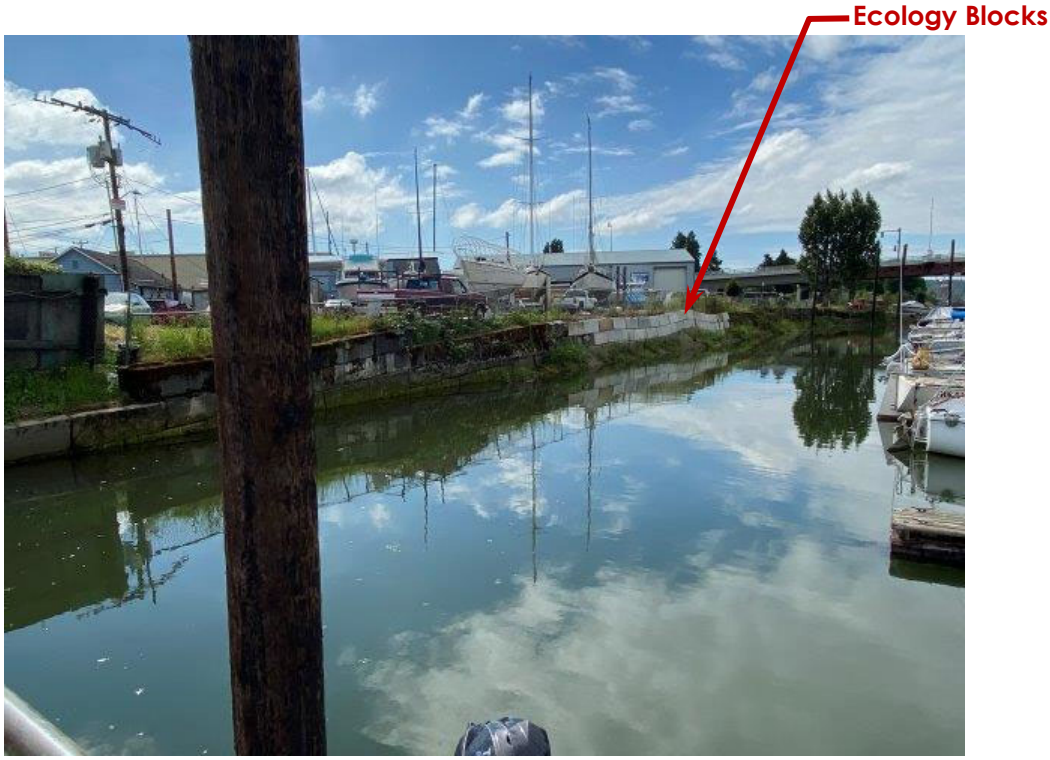


Photo ST20-06: Retaining Wall Bulkhead (Looking North)

PHOTOGRAPHS

Photo ST20-07: Boat Ramp (Looking Northwest)

Photo ST20-08: Boat Ramp (Looking West)

PHOTOGRAPHS

Photo ST20-09: Gangway and Walkway (Looking West)

Photo ST20-10: Services (Looking West)

PHOTOGRAPHS

Photo ST20-12: Secondary Walkway (Looking North)

PHOTOGRAPHS

Photo ST20-13: West Secondary Walkway (Looking North)

Photo ST20-014: Utilities

PHOTOGRAPHS

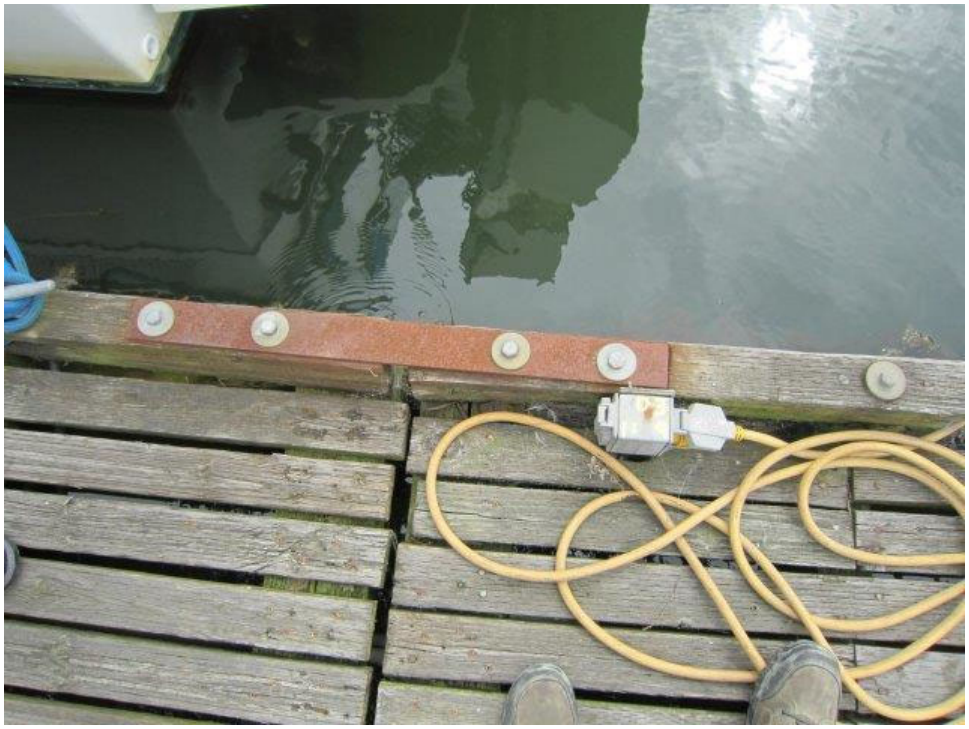


Photo ST20-15: Utilities

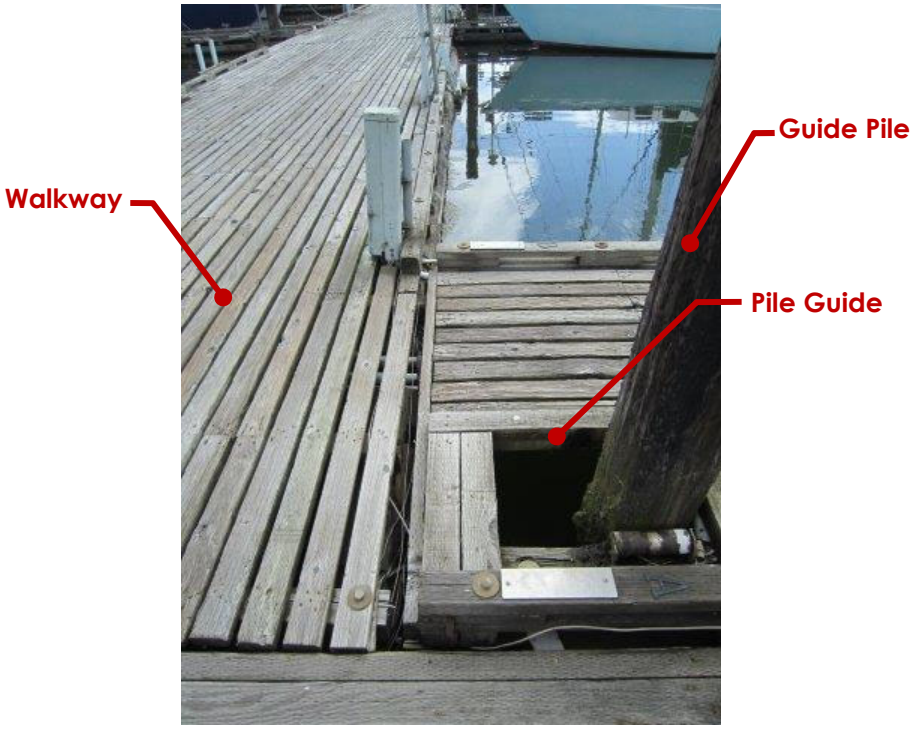


Photo ST20-16: Float Guide

PHOTOGRAPHS

Photo ST20-17: Float Guide

Photo ST20-018: Float Guide

PHOTOGRAPHS

Photo ST20-19: Float Guide

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST20 – South Park Marina, 3.4 - West

Inspection Date: July 17, 2020
July 14, 2021
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants	X	Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains	X	Steep or unstable slope/revetment
	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

	Cracking or Breakage
	Staining
	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

X	Settlement	X	Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	
Cracking	
Scaling	
Spalls, pop outs, and delamination	
Stains, Efflorescence	
Exposed Reinforcement: Corrosion	
Damage or distress	
Missing or broken members	
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Curling and warping	
Erosion	
Previous Patching or Other Repair:	
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	
Exposed Aggregate	
Leaks through Walls	
Structural Defects	
Moss	

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST20 – South Park Marina, 3.4 - West

Inspection Date: July 17, 2020
July 14, 2021
Prepared By: Ade Bright

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
	Abrasion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Member cracking or breakage
X	Staining, corrosion
X	Surface deposits
X	Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement	X	Deflection/Leaning

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	X
Rust and scale	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	X
Stains	X
Corrosion	X
Abrasion	X
Previous Repair	X
Surface Coatings	X
Debris Buildup	X
Structural Defects	X
Moss	X

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST20 – South Park Marina, 3.4 - West

Inspection Date: July 17, 2020
July 14, 2021
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	X
Fasteners: Corrosion	X
Soft timber and decay	X
Abrasion	X
Previous Repair	X
Surface Coatings, Protective Systems	X
Debris Buildup	X
Structural Defects	X
Moss	X

Appendix F
Attachment F-1b Phase II Detailed Inspection FCA Reports: Outfalls

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2061

Ecology ID: 2061

Facility Location: River Mile 3.7

Direction (side) East

STA 296+30

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas.

The structure consists of:

- Steel outfall with duckbill valve supported by and projecting a few inches outside the steel sheet pile bulkhead (Photo 1).
- Pipe size could not be measured.
- Outfall is surrounded by concrete collar behind the sheet pile (Photo 2).
- The outfall appears to be operational.

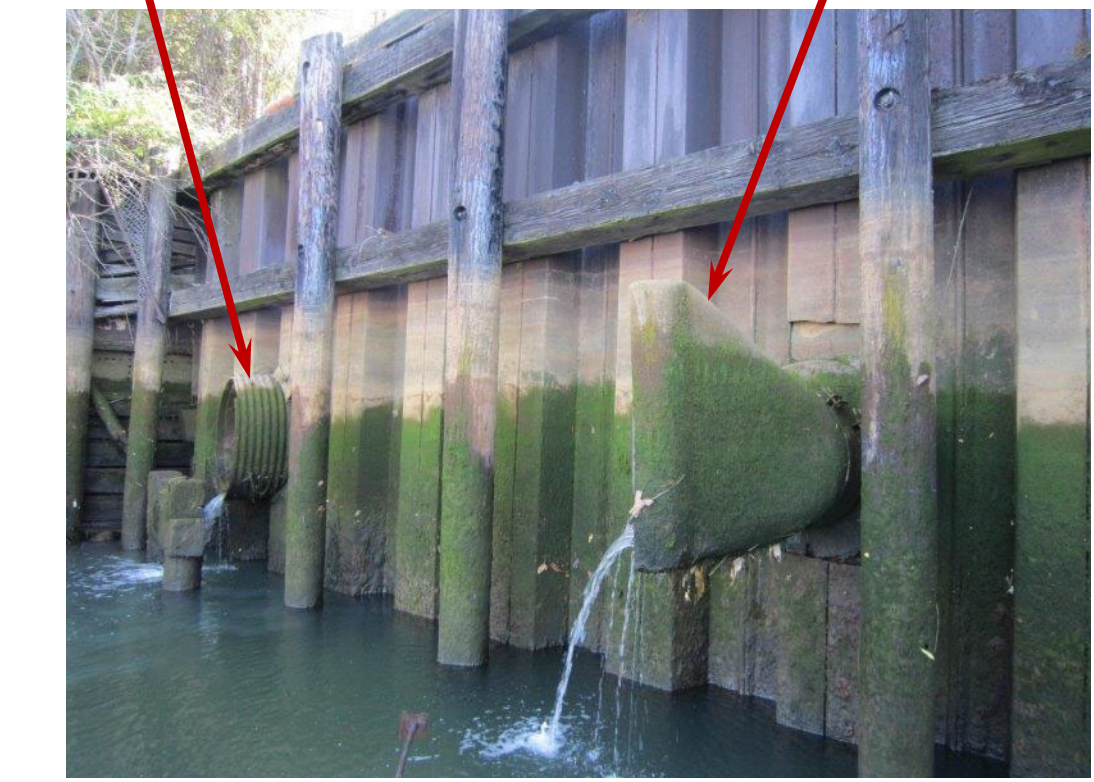
Accessibility:

- Outfall is accessible from the water side.

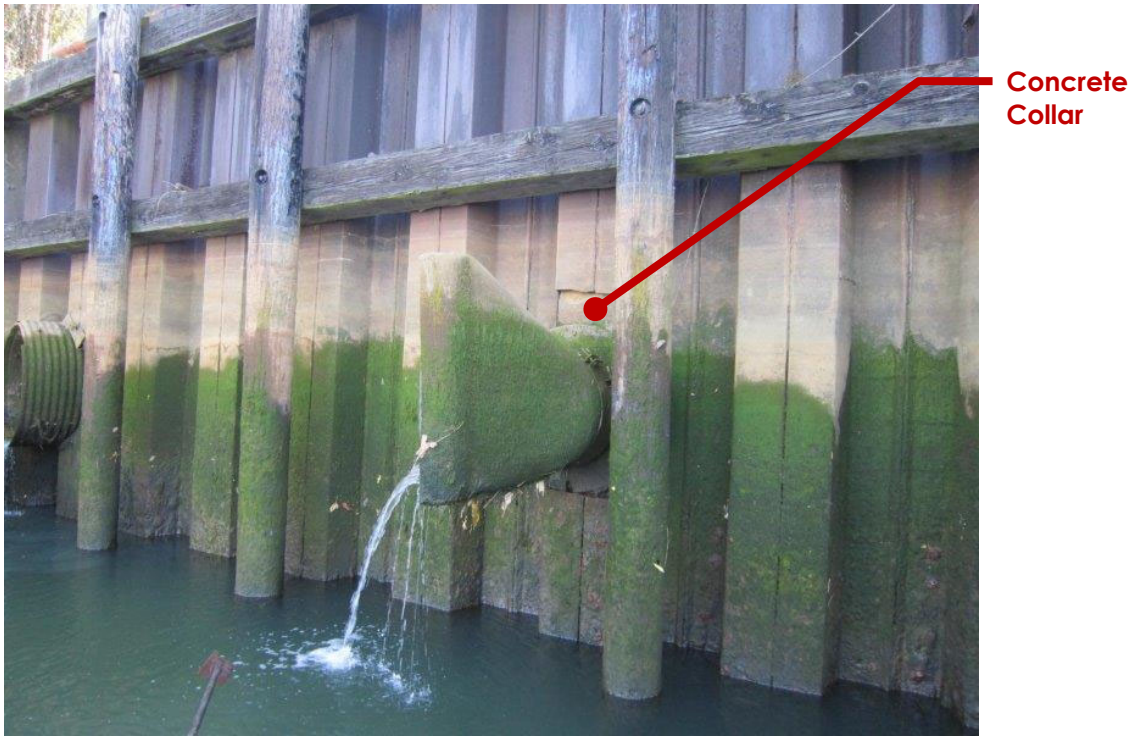
Potential Hazards:

- None.

PHOTOGRAPHS



2061-01: Outfall at Low Tide



2061-02: Outfall Support

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2072

Ecology ID: 2072

Facility Location: River Mile 3.7

Direction (side) East

STA 291+40

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The structure consists of:

- Outfall end is supported by and approximately flush with steel sheet pile bulkhead (Photos 1 to 3).
- Outfall is 18-inch-diameter open-ended concrete pipe surrounded by rock backfill behind the sheet pile.
- South half of pipe is broken at the end.
- Outfall appears to be operational.

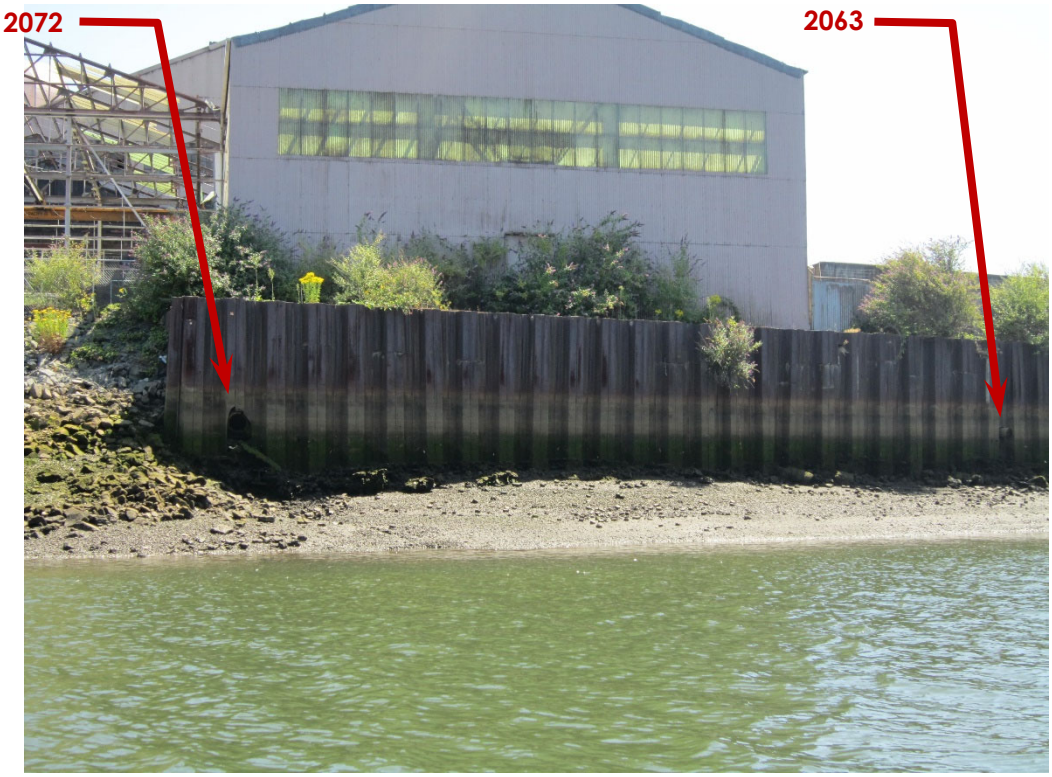
Accessibility:

- Outfall is unobstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



2072-01: Concrete Outfall at Low Tide

2072-02: Concrete Outfall at High Tide

PHOTOGRAPHS

2072-03: Concrete Outfall at Low tide

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2063

Ecology ID: 2063

Facility Location: River Mile 3.7

Direction (side) East

STA 292+60

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspections were conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The structure consists of:

- Outfall is 12-inch-diameter open-ended corrugated metal (steel) pipe (CMP). Pipe material is in good condition (Photos 1 to 4).
- Pipe supported by and overhangs the sheet pile bulkhead.
- Outfall is plugged with concrete and appears abandoned although slow drips were observed.

Accessibility:

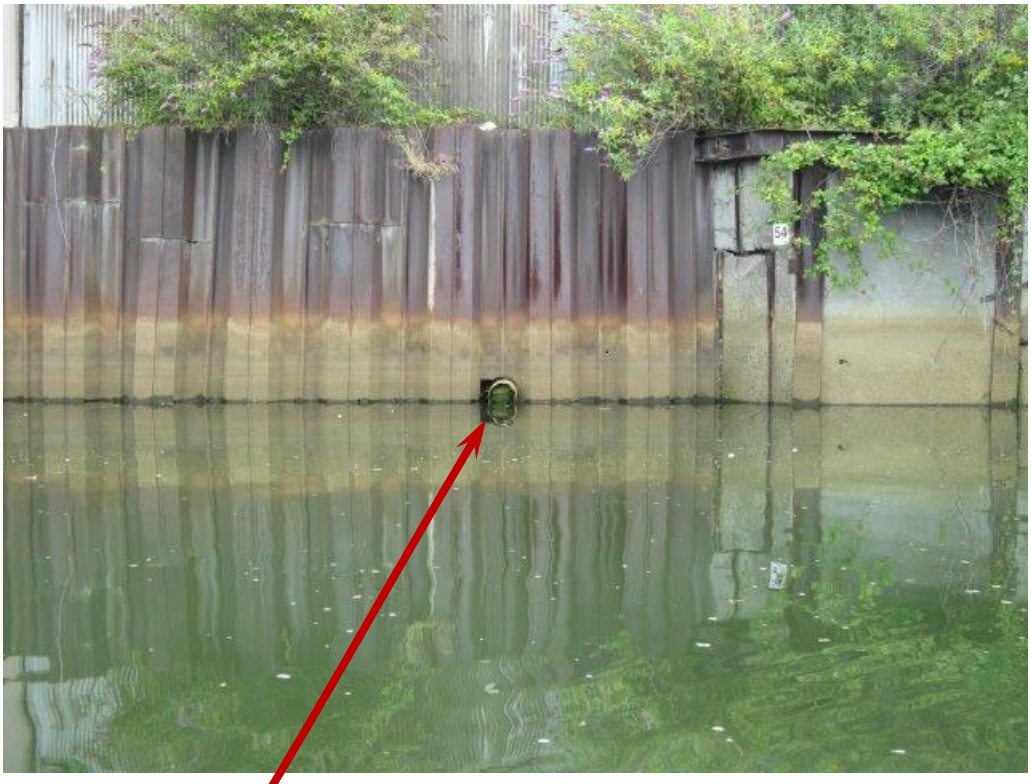
- Outfall is unobstructed.

Potential Hazards:

- None observed.

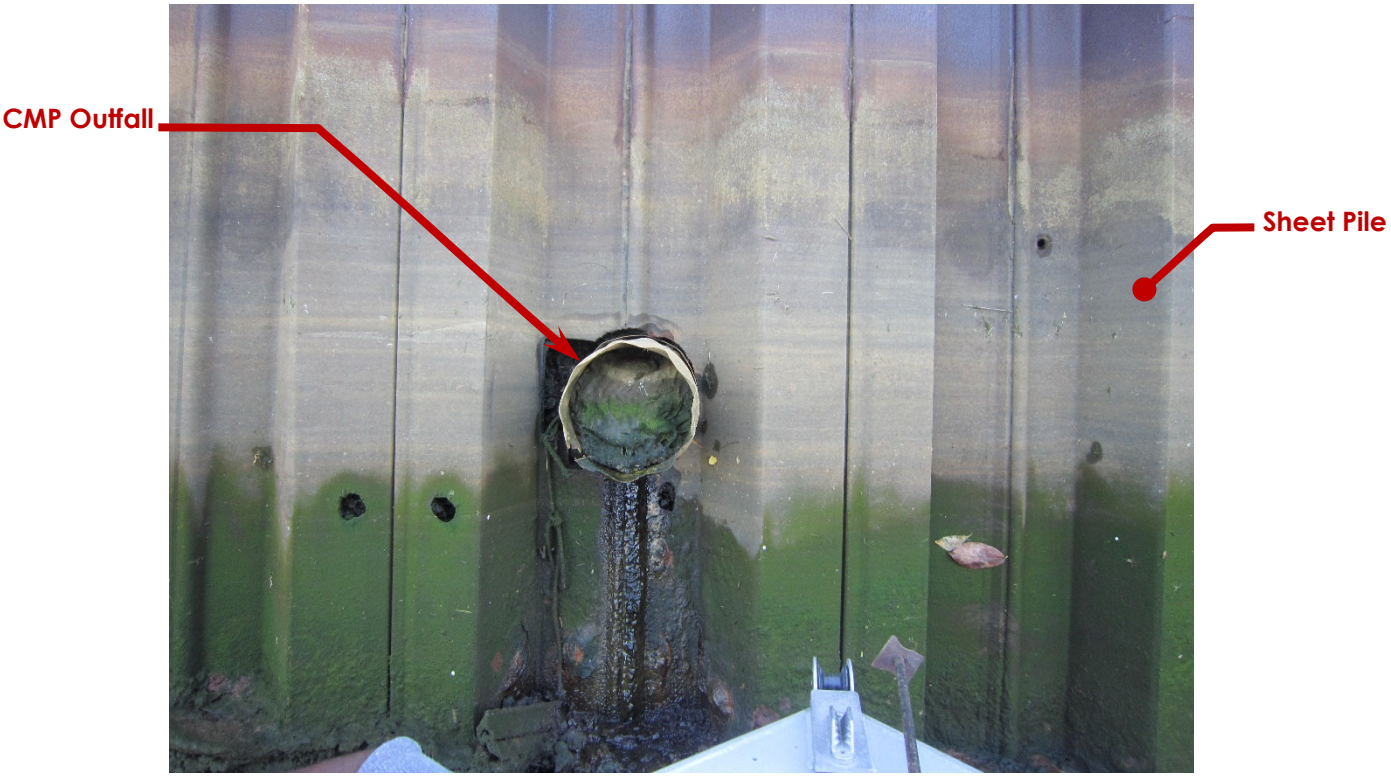
PHOTOGRAPHS

2063-01

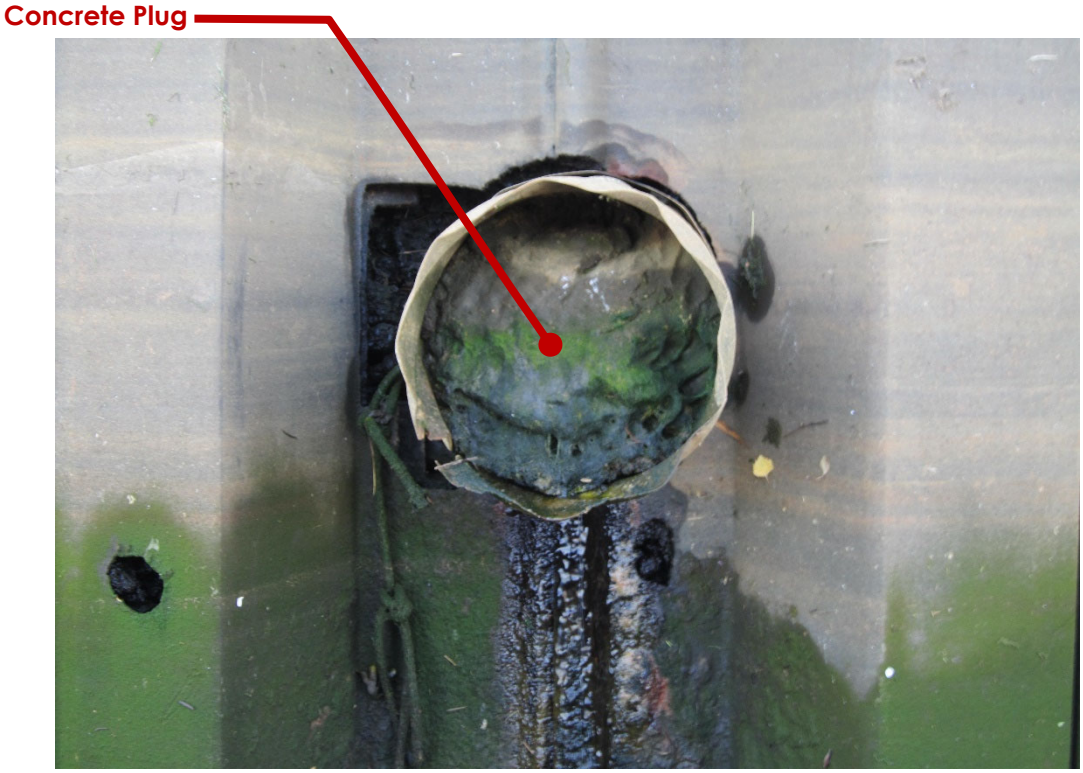


2063-02: Outfall at High Tide

PHOTOGRAPHS



2063-03: Outfall at Low Tide



2063-04

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2062

Ecology ID: 2062

Facility Location: River Mile 3.7

Direction (side) East

STA 296+10

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas.

The structure consists of:

- 48-in diameter CMP (Corrugated Metal Pipe-Steel) outfall is supported by and projects a few inches outside the steel sheet pile bulkhead (Photos 1 to 4). IE (Invert Elevation) 7.29.
- It appears that pipe end was previously supported on wood saddle and two timber piles. Pipe has been cut short of this support, therefore the support is not in use (Photos 1, 3, and 4).
- Pipe is fitted with rubber liner and flap valve (Photo 4).
- Outfall appears to be operational.

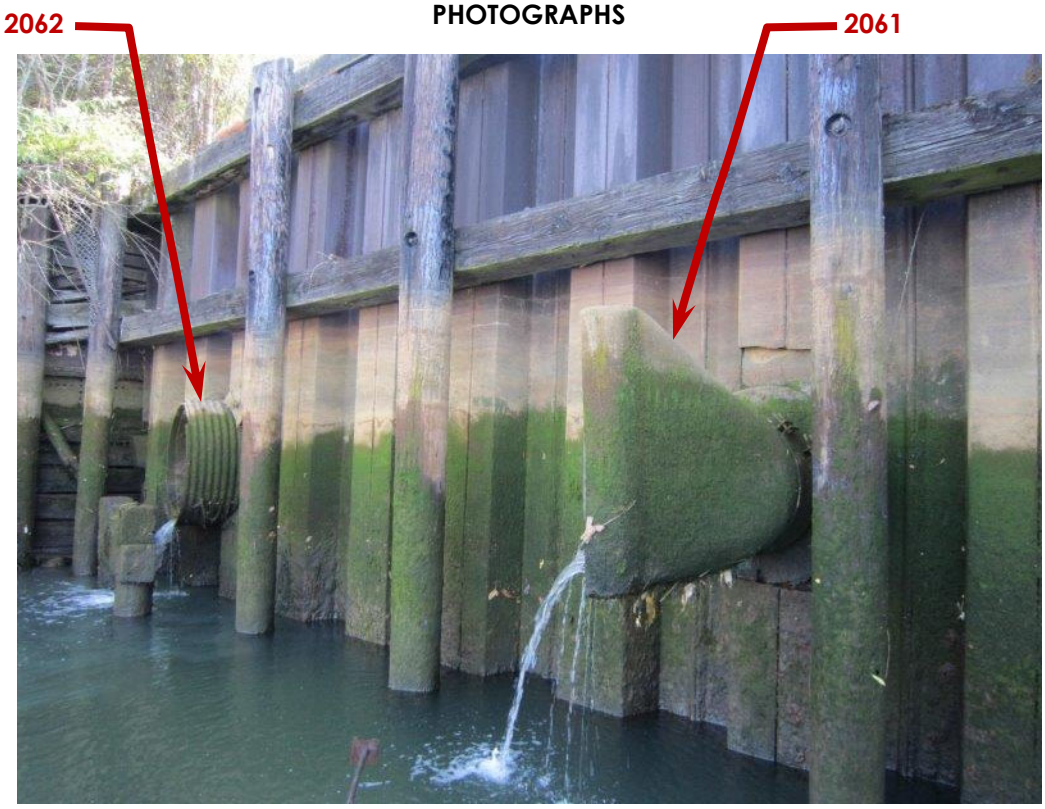
Accessibility:

- Outfall is not obstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS



2062-01: Outfall at Low Tide

2062-02: Outfall at High Tide

PHOTOGRAPHS

2062-03: Unused Support

2062-04: Pipe End

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2077

Ecology ID: 2077

Facility Location: River Mile 3.8

Direction (side) East

STA 301+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas.

The structure consists of:

- The outfall is supported on and overhangs timber piles and lagging along the shoreline (Photos 1 and 2).
- Pipe is 20-in diameter, flanged steel pipe outfall diffuser with duckbill valve and concrete collar/armoring (Photo 3).
- Exposed top section of the timber piles and lagging are deteriorated.
- Outfall appears to be operational.

Accessibility:

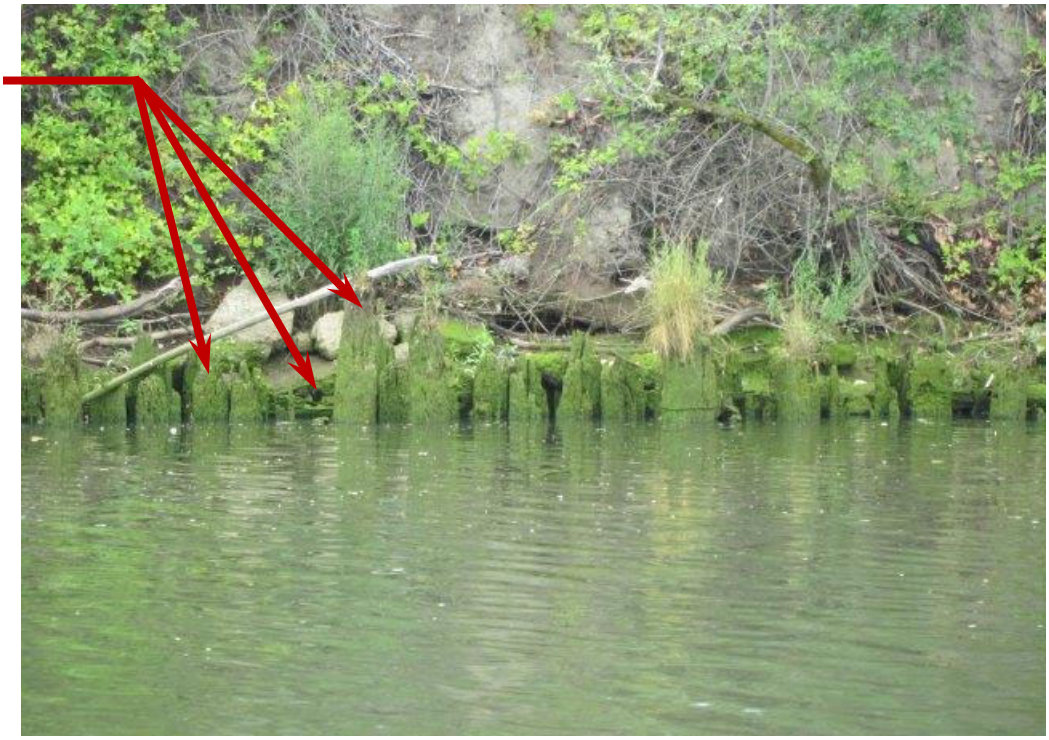
- Outfall is accessible from the water side.

Potential Hazards:

- None.

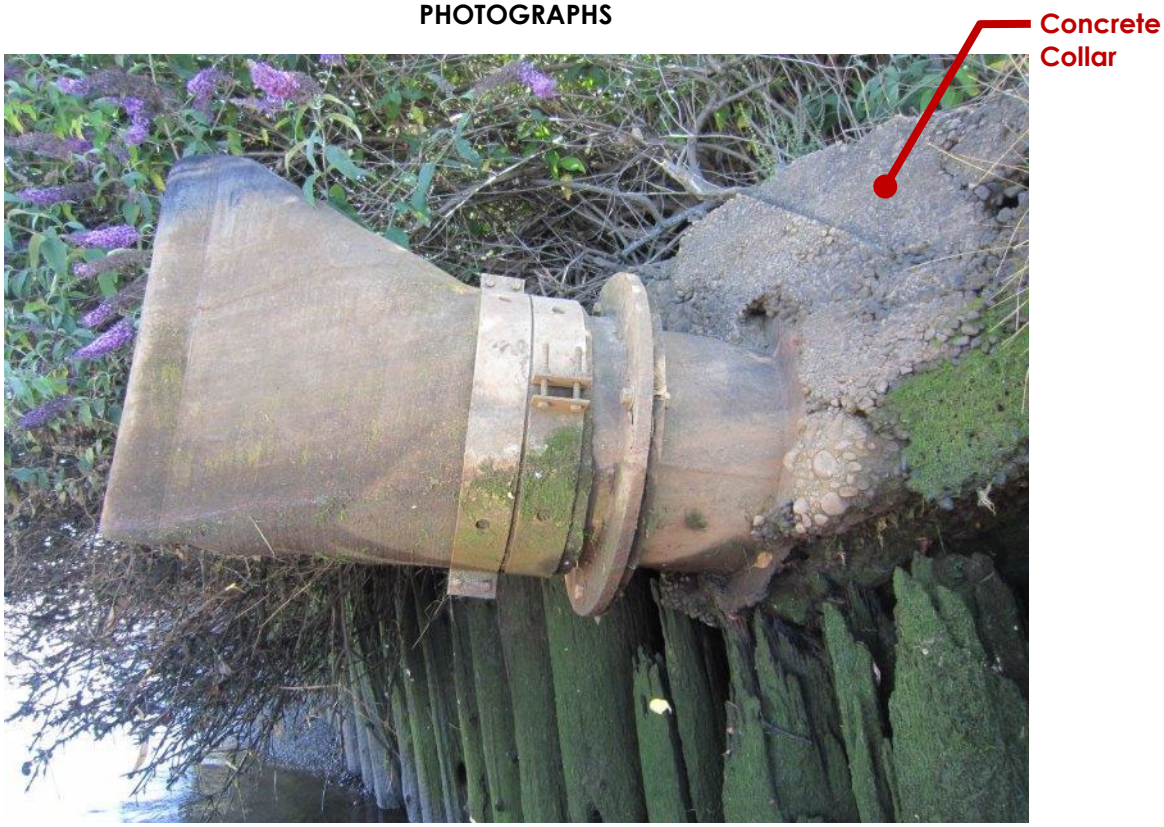
PHOTOGRAPHS

2077-01: Outfall at High Tide



2077-02: Shoreline Timber Pile Bulkhead

PHOTOGRAPHS



2077-03: Support

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2076

Ecology ID: 2076

Facility Location: River Mile 3.9

Direction (side) East

STA 301+70

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

Outfall was not observed during our inspections nor in the survey. GIS mapping information indicates the outfall is a 30" diameter steel pipe.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2075

Ecology ID: 2075

Facility Location: River Mile 3.9

Direction (side) East

STA 301+80

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspections were conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The structure consists of:

- Outfall is 32-inch-diameter pipe riser (Photo 1).
- Outfall is located on the riverbed several feet offshore of the sheet piles.
- Pipe size, support, and condition could not be observed.

Accessibility:

- Outfall is unobstructed and can only be observed during very low tide.

Potential Hazards:

- None observed.

PHOTOGRAPHS

2075-01: Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2074

Ecology ID: 2074

Facility Location: River Mile 3.9

Direction (side) East

STA 304+70

Asset Type: Outfall

Use: Drainage

Inspection Date: July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspections were conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The structure consists of:

- Outfall is 8-inch-diameter corrugated metal (steel) pipe (CMP). Pipe material is in good condition (Photos 1 to 2).
- Pipe supported by and overhangs the sheet pile bulkhead.
- Outfall is plugged with bricks and appears abandoned although slow drips were observed.

Accessibility:

- Outfall is unobstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS

2074-01

2074-02: Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2073

Ecology ID: 2073

Facility Location: River Mile 3.9

Direction (side) East

STA 307+10

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 12, 2021

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements were complete.

The structure consists of:

- 18-inch diameter, open-ended concrete outfall supported on concrete apron, protected with an inverted, 3-sided concrete box (subtended) and riprap (Photos 1 and 2); IE (Invert Elevation) 9.30.
- It appears the outfall is plugged.

Accessibility:

- Outfall is accessible on the water side.

Potential Hazards:

- None observed.

PHOTOGRAPHS

2073-01: Outfall Box at High Tide

2073-02: Outfall at Low Tide

PHOTOGRAPHS

2073-03: Close Up of Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: BDC-2

Ecology ID: BDC-2

Facility Location: River Mile 4.6

Direction (side) East

STA 363+20

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

Outfall was not observed during our inspections nor in the Survey. GIS mapping information appears to indicate the outfall is 12" diameter, lined steel pipe. It appears to be corroded.

Accessibility:

- Not observed.

Potential Hazards:

- None.

PHOTOGRAPHS

BDC-2 -01

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2092

Ecology ID: 2092

Facility Location: River Mile 4.8

Direction (side) East

STA 370+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas. Physical measurements or close up observations were collected where possible.

The structure consists of:

- Outfall pipe projects beyond the shoreline and surrounded with riprap and concrete panel rubbles (Photo 1).
- Outfall is 15-in diameter concrete pipe supported on concrete rubbles and quarry spalls apron (Photo 2).

Accessibility:

- No obstructions observed.
- In proximity of groin timber piles that are not in a sound condition.

Potental Hazards:

- None observed.

PHOTOGRAPHS

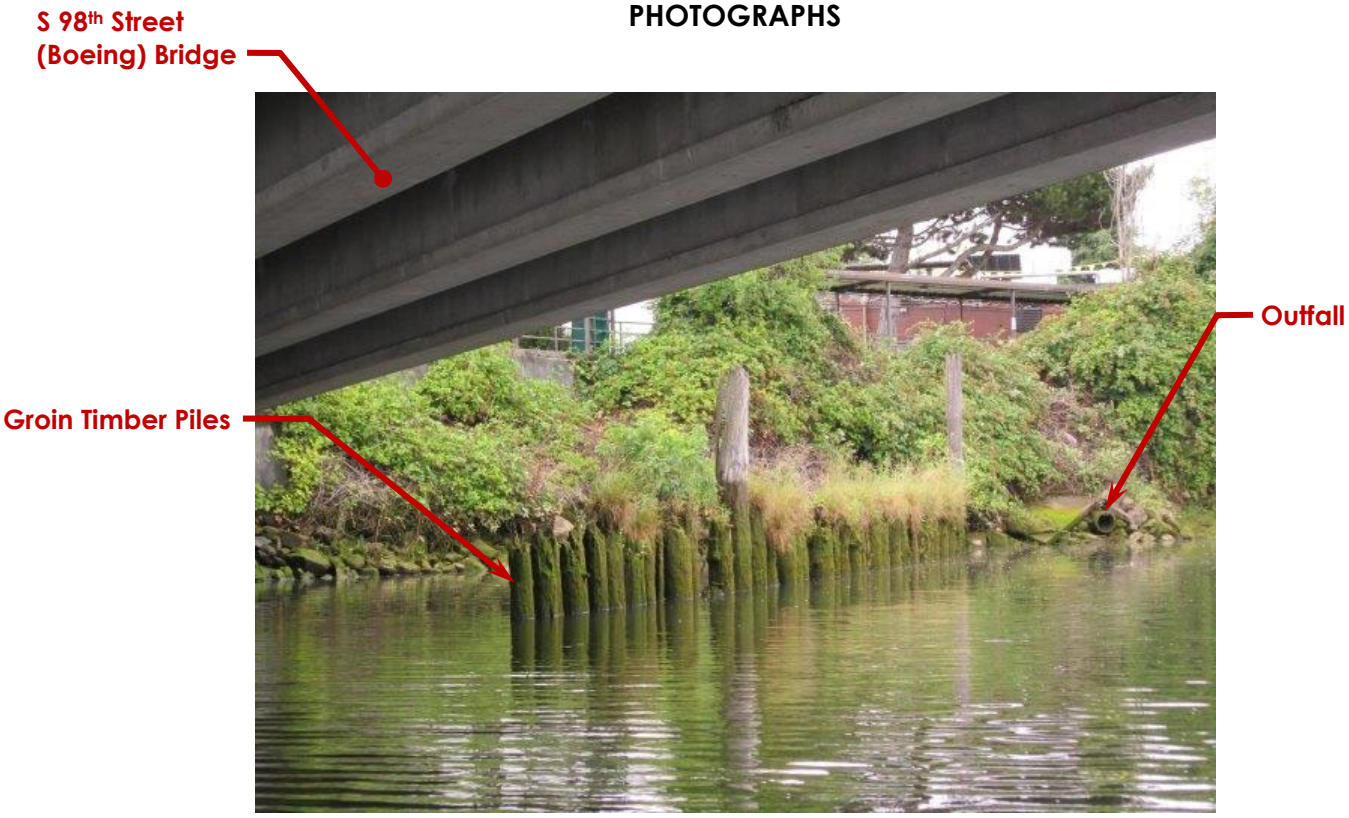


Photo 2092-01: Outfall (Looking East)

Photo 2092-02: Outfall (Looking East)

PHOTOGRAPHS

Photo 2092-03: Outfall at Low Tide

Photo 2092-04: Outfall Closeup

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2097

Ecology ID: 2097

Facility Location: River Mile 4.8

Direction (side) East

STA 371+50

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

Outfall was not observed during our inspections nor in the survey. GIS mapping information indicates the outfall is an 8" diameter steel pipe.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: BDC-5

Ecology ID: BDC-5

Facility Location: River Mile 4.8

Direction (side) East

STA 372+40

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

Outfall was not observed during our inspections nor in the survey. GIS mapping information indicates the outfall is a 12" diameter concrete pipe.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2096

Ecology ID: 2096

Facility Location: River Mile 4.8

Direction (side) East

STA 373+50

Asset Type: Outfall

Use: Drainage

Inspection Date: July 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspections were conducted from the water side and during low tide. Observations are limited to boat accessible areas.

The structure consists of:

- Outfall is 6-inch-diameter open-ended iron pipe. Pipe material is in good condition (Photos 1 to 3).
- Pipe overhangs heavily vegetated embankment.
- The support of the outfall could not be observed.

Accessibility:

- Outfall is unobstructed.

Potential Hazards:

- None observed.

PHOTOGRAPHS

2096-01: Outfall Location

2096-02: Outfall

PHOTOGRAPHS

2096-03: Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/07/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2093

Ecology ID: 2093

Facility Location: River Mile 4.9

Direction (side) East

STA 375+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall projects a few feet past the shoreline. Protected with what apprears to be riprap and concrete debris (Photos 1 and 2).
- Outfall is 24-inch diameter concrete pipe with bell end. IE (Invert Elevation) 7.24 (Photos 3 to 5).
- A liner inside the pipe was observed (Photo 3).
- Outfall is supported on a concrete apron (Photos 4 and 5).

Accessibility:

- No obstructions observed.
- In proximity of groin timber piles that are not in a sound condition.

Potental Hazards:

- Condition of support beneath the outfall was not observed.

PHOTOGRAPHS

Photo 2093-01

Photo 2093-02: Outfall (Looking Northeast)

PHOTOGRAPHS

Photo 2093-03: Outfall Close Up

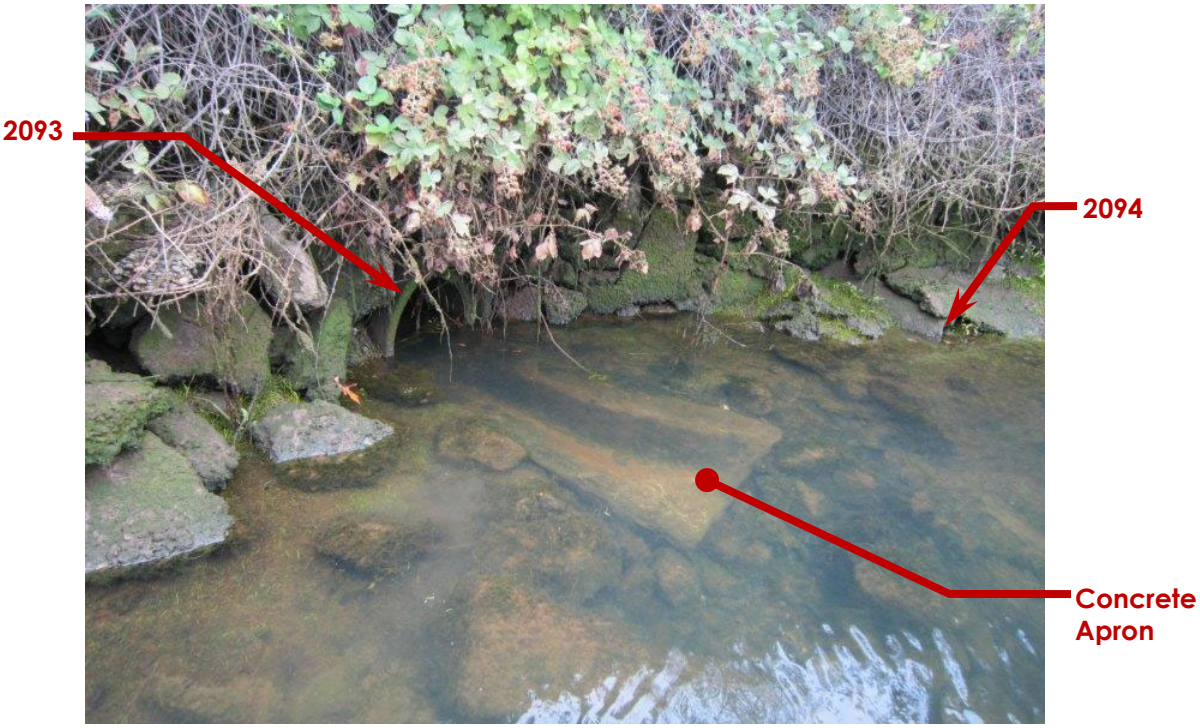


Photo 2093-04: Outfall at Mid Tide

PHOTOGRAPHS

Photo 2093-05: Outfall at Low Tide

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2094

Ecology ID: 2094

Facility Location: River Mile 4.9

Direction (side) East

STA 375+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The outfall is a 12" diameter concrete pipe and is inactive (Photos 1 and 2).

Accessibility:

- Not observed.

Potential Hazards:

- None.

PHOTOGRAPHS

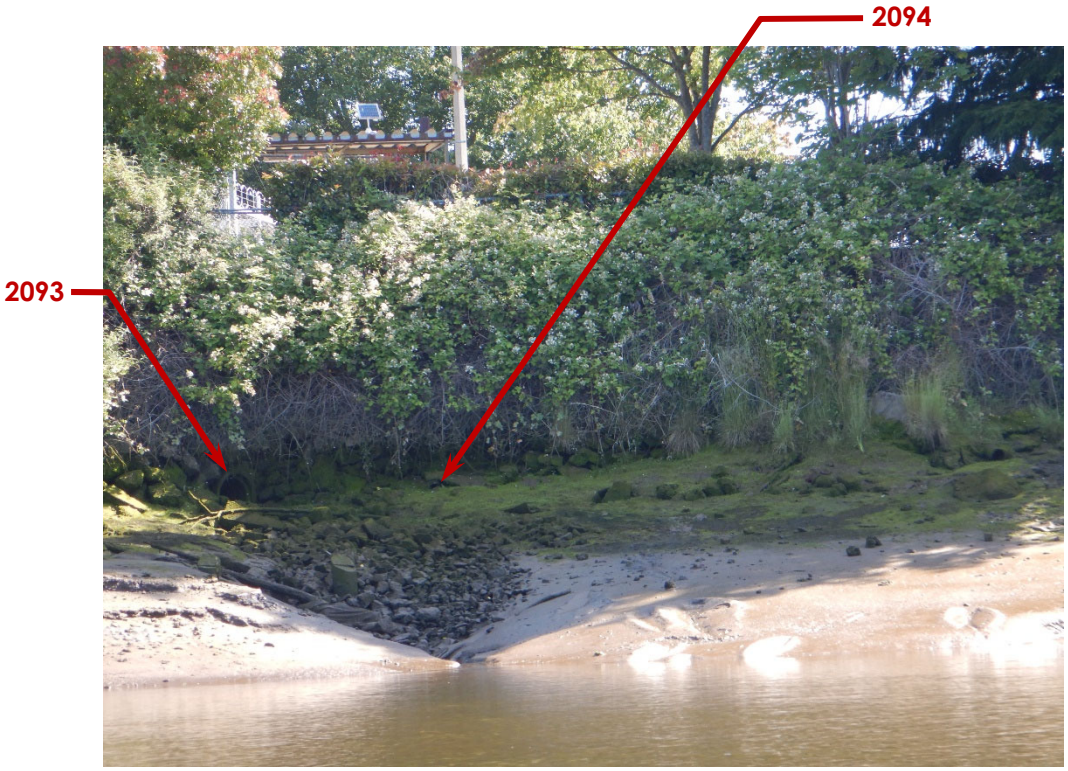


Photo 2094-01

Photo 2094-02: Outfall Closeup

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: Norfolk CSO/SD (2095)

Ecology ID: 2095

Facility Location: River Mile 4.9

Direction (side) East

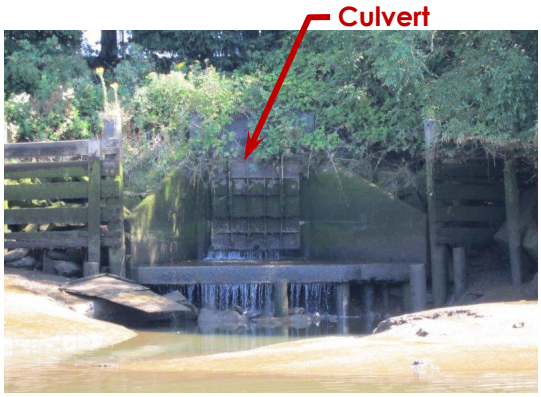
STA 376+30

Asset Type: Culvert

Use: Drainage

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

The structure consists of:

- Concrete culvet consists of concrete head wall, wing walls, and 72-in x 72-in flow control cast iron flap gate. Concrete apron is timber pile supported (Photos 1 to 4).
- The condition of the culvert could not be observed.
- On the north and south sides are timber fencing consisting of timber piles/posts and horizontal slats. Behind the fence is quarry spalls (Photos 1 and 3).

Accessibility:

- The culvert is recessed into the embankment and between timber fencing. Accessibility may be limited.

Potental Hazards:

- Condition of support beneath the culvert and stability of the retaining walls was not observed.

PHOTOGRAPHS

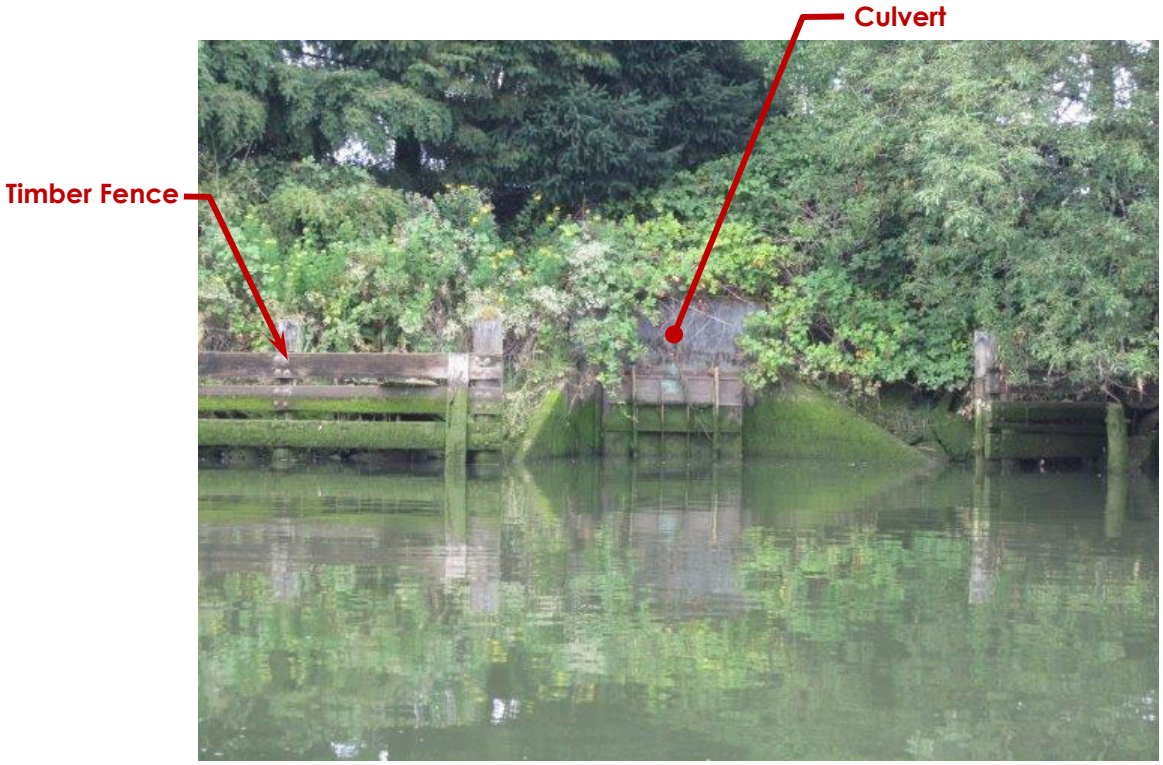


Photo 2095-01: Culvert (Looking East)

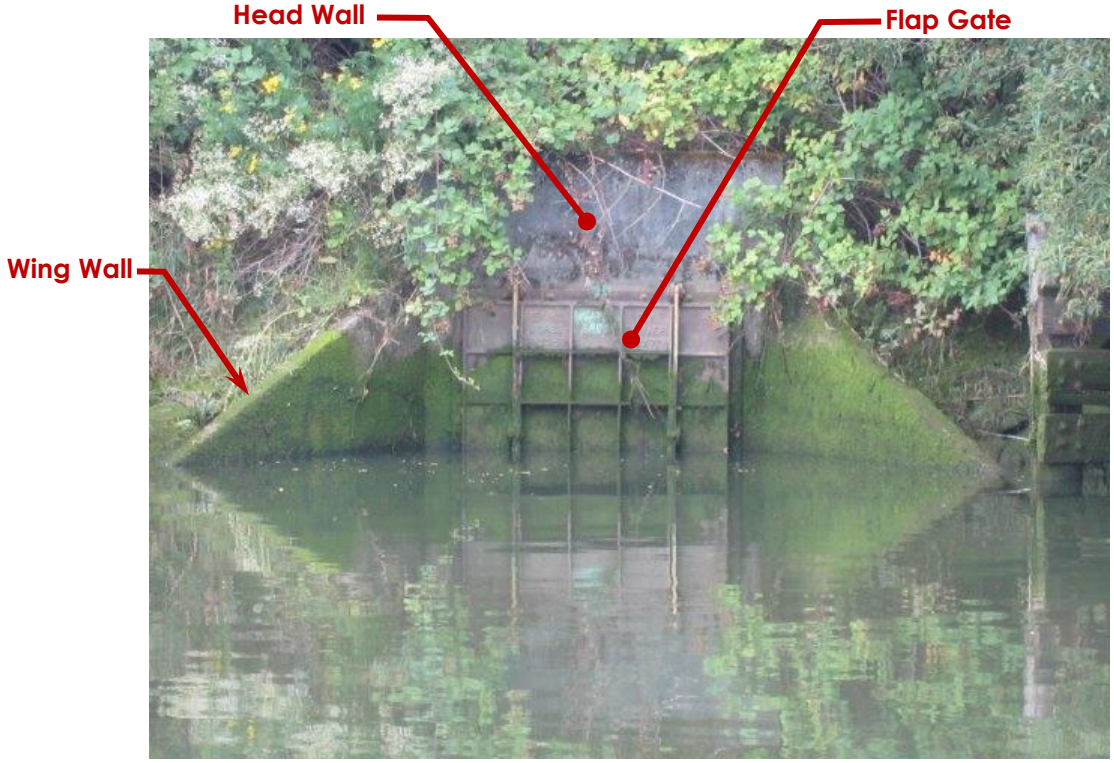


Photo 2095-02: Close Up of Culvert

PHOTOGRAPHS

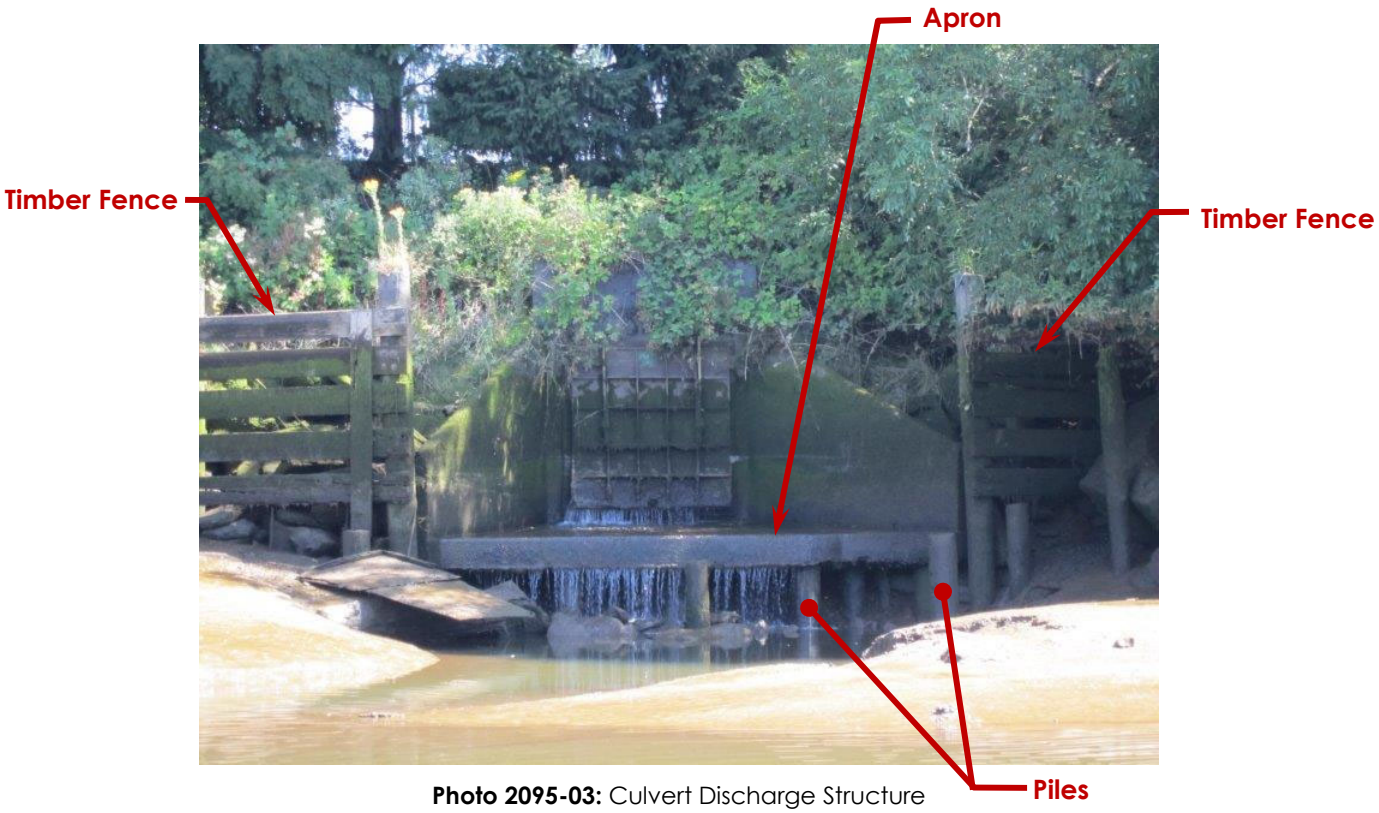


Photo 2095-03: Culvert Discharge Structure

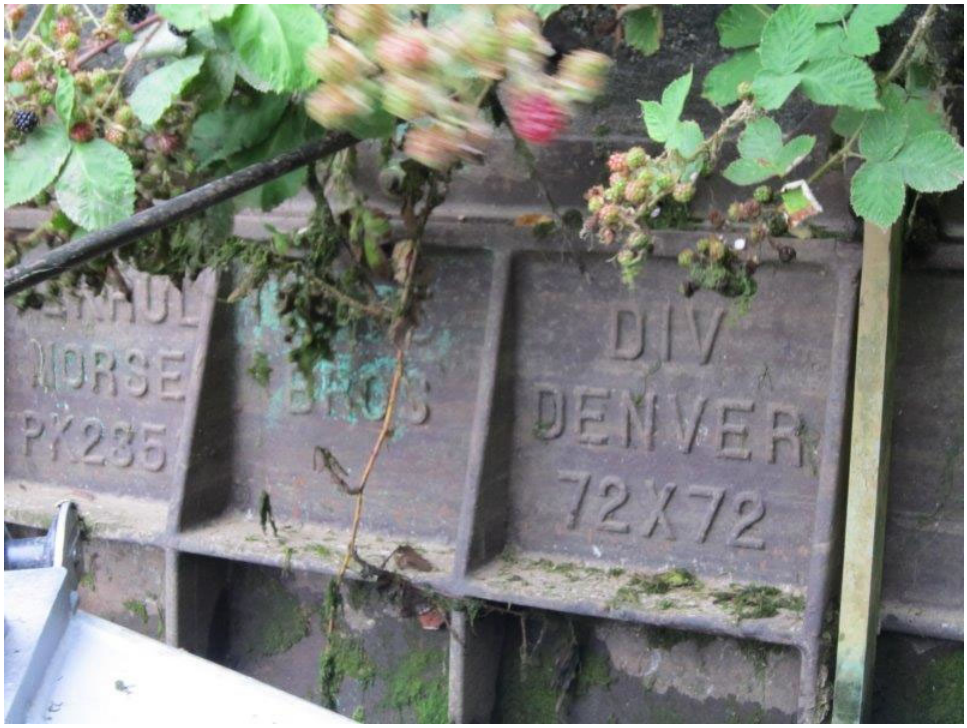


Photo 2095-04: Cast Iron Gate

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: T117

Ecology ID: T117

Facility Location: River Mile 3.5

Direction (side) West

STA 491+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 12, 14 and 29, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas.

Outfall was not observed during our inspections nor in the survey or GIS mapping information. Photos appear to indicate a steel pipe surrounded by riprap. Diameter and support condition has yet to be determined. Outfall is located between T117 site and South Park Marina.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I/II

Facility Name: 2214

Ecology ID: 2214

Facility Location: River Mile 3.5

Direction (side) West

STA 492+20

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall projects beyond the riprap shoreline (Photo 1).
- Size, material, and condition were not observed closely.

Accessibility:

- No obstruction is observed.

Potental Hazards:

- None observed.

PHOTOGRAPHS

Photo 2214-01: Outfall (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 12/20/2021

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Ph I/II

Facility Name: 2215

Ecology ID: 2215

Facility Location: River Mile 3.3

Direction (side) West

STA 500+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020, July 14, 2021

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were collected.

The structure consists of:

- Outfall with duckbill valve near the shoreline supported on a mound of quarry spalls (Photos 1 to 4).
- Approximately 24" diameter concrete pipe supported by quarry spalls and apron.

Accessibility:

- No obstruction observed.

Potental Hazards:

- None observed.

PHOTOGRAPHS

Photo 2215-01: Outfall (Looking West)

Photo 2215-02: Outfall (Looking Northwest)

PHOTOGRAPHS

Photo 2215-03: Outfall (Looking Southwest)

Photo 2215-03: Outfall Close Up

Appendix F
Attachment F-2a Phase I Visual Inspection FCA Reports: Structures

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST01
Boeing Plant 2
Parcel No. 218000005, 22000005

WUS#: 38

Facility Location: River Mile 3.0

Direction (side) East

STA 254+00 to STA 264+00

Asset Type: Pile-Supported Building

Use: Historical Overwater Buildings, Warehouse

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview
Image Capture: Aug 2019 ©Google

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Timber pile-supported building on concrete deck and a timber pile-supported concrete apron on the north end
- The entire west face of the fendering piles is lagged with timber. At south and north end sections of the building, rubber sheets cover the piles. It is unknown of the lagging exist in these areas. It appears that the lagging serves as skirting rather than retaining.
- The toe of the shoreline in front of the fender piles is armored with riprap and concrete panel rubble.
- The slope beyond the fender pile are armored with riprap.
- There is moss on the surfaces of lagging and pile sections in the wet/dry zone. The condition of the lagging and piles cannot be determined.

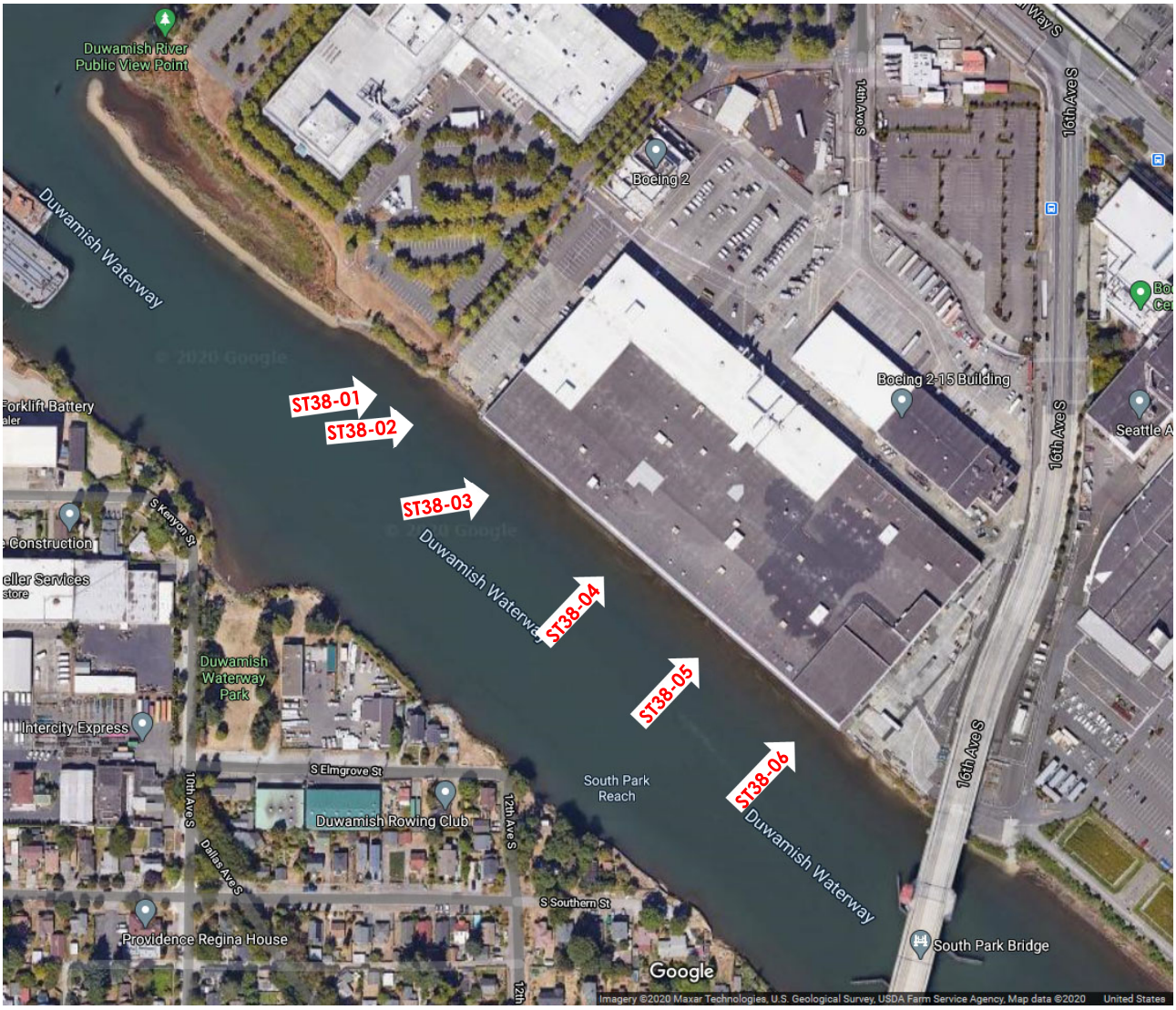
Accessibility:

- The timber lagging and fender piles are accessible from the water side.
- Lagging and steel chainlink fabric fender piles precent access to piles beyond.

Potental Hazards:

- No overhead strucutures were observed along the face of the bulkhead.

VICINITY MAP



PHOTOGRAPHS

Photo ST38-01: North End (Looking East)

Photo ST38-02: North End of Building

PHOTOGRAPHS

Photo ST38-03: Mid to South End of Building

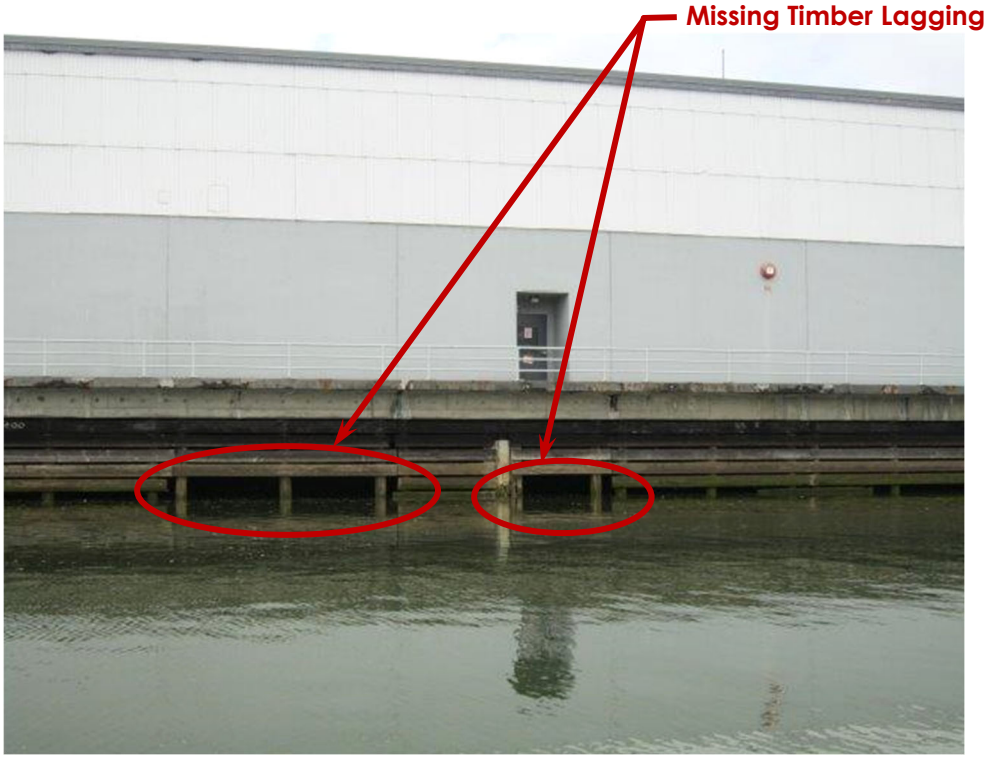


Photo ST38-04: Mid Section of Building

PHOTOGRAPHS

Photo ST38-05: South End of Building

Photo ST38-06: South Apron

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST06
Overhead Power Line Crossing
Parcel No. N/A

WUS#: 50

Facility Location: River Mile 4.3

Direction (side) River Crossing

STA 350+40 to STA 438+30

Site Overview

Asset Type: Overhead Power Line

Use: Power Transmission

Inspection Date: July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

- The structure is an overhead power transmission line crossing the river consisting of one tower offshore of the east and one offshore of the west banks of the river. The transmission line is tied to the fenced-in Duwamish Electrical Substation west of the west tower (Photos 1 to 6).
- The west tower is supported by concrete pier (Photos 5 and 6). The east tower foundation is not visible and cannot be determined (Photo 7).
- Bulkhead along the west bank consisting of concrete and timber retainining walls along the upper slope and rip rap along the lower and toe of the slope. The embankment consists of vegetation and vegetated rip rap (Photos 1 to 6).
- The embankment around the east tower consists of vegetated rip rap (Photo 7).

Accessibility:

- The west tower and embankment are accessible from the land side.
- The east tower appears to be accessible from the land side, however the east embankment appears steep and may only be accessible from the water side.

Potental Hazards:

- Overhead structure consists of high power transmission lines. The overhead clearance is unknown.
- The east tower embankment appears to be steep and heavily vegetated.

VICINITY MAP

PHOTOGRAPHS

Photo ST06-01: West Shoreline Bulkhead South End

Photo ST06-02: West Shoreline Bulkhead

PHOTOGRAPHS

Photo ST06-03: West Shoreline Bulkhead

Photo ST06-04: West Shoreline North End

PHOTOGRAPHS

Photo ST06-05: West Tower (Looking West)

Photo ST06-06: West Shoreline

PHOTOGRAPHS

Photo ST06-07: East Shoreline

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST09
Miscellaneous Bulkhead – 1
Parcel No. N/A

WUS#: None

Facility Location: River Mile 4.9

Direction (side) East

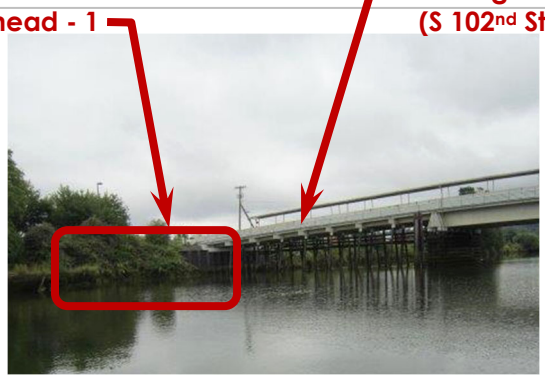
STA 378+50 to STA 380+00

Asset Type: Bulkhead

Use: Soil Retention, Shoreline Protection

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is just north of the Boeing Oxbow (S 102nd St) Bridge and consists of:

- Timber soldier pile and concrete panel lagging (Photo 1 and 2).
- Missing timber soldier piles in front of the concrete lagging. It appears that the south end of the wall is tied back or connected to a steel sheet wall. Large cracks throughout the concrete panel. Wall is in poor condition.
- Derelict timber barge or boat hull (Photos 1 and 3). The hull appears to be intact. Condition of the timber is unknown.
- Timber soldier pile and timber lagging (Photo 3).
- Missing, broken, or unfound timber piles and lagging.

Accessibility:

- No obstruction observed.

Potential Hazards:

- Stability of structure unknown.

PHOTOGRAPHS

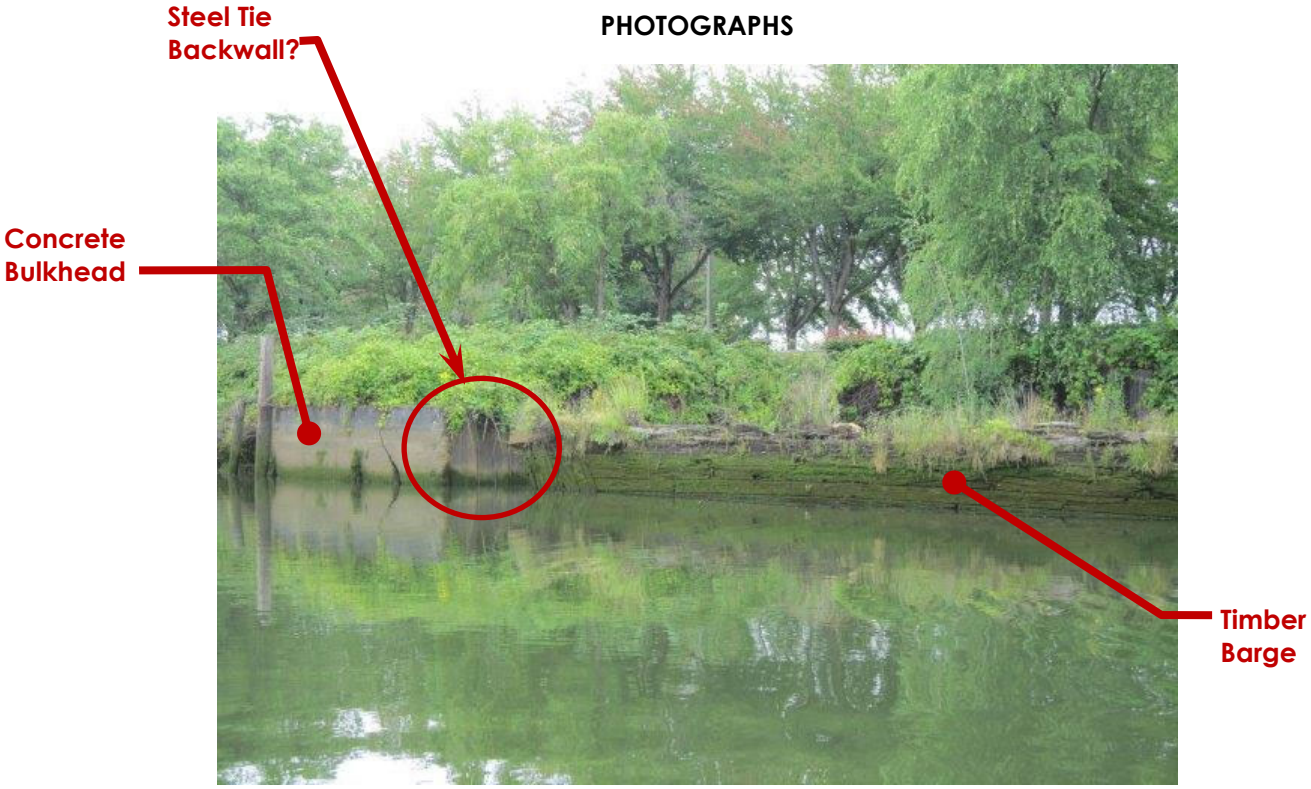


Photo ST09-01: Bulkhead (Looking East)

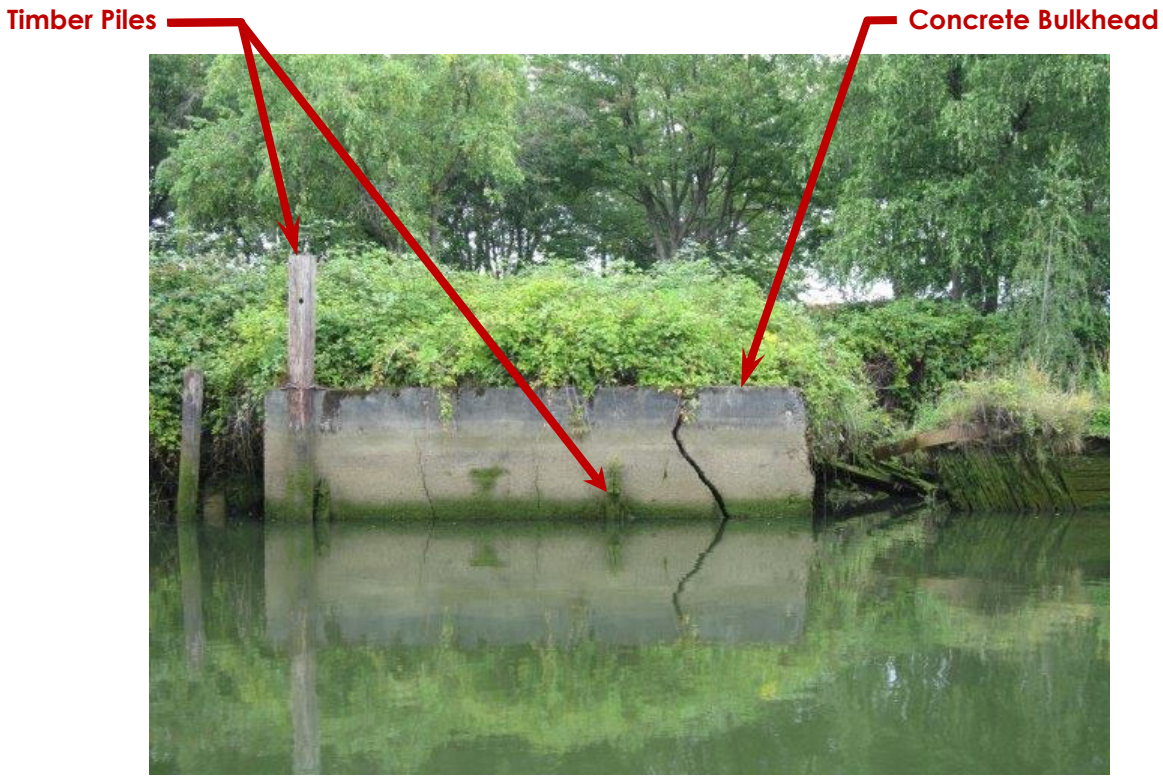


Photo ST09-02: Enlarged Concrete Bulkhead

PHOTOGRAPHS

Photo ST09-03: Timber Barge and Bulkhead (Looking East)

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST09 – Miscellaneous Bulkhead – 1, 4.9 - East

Inspection Date: July 17, 2020
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants		Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

X	Cracking or Breakage
	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor	X	Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Scaling	
Spalls, pop outs, and delamination	
Stains, Efflorescence	
Exposed Reinforcement: Corrosion	
Damage or distress	X
Missing or broken members	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Curling and warping	
Erosion	
Previous Patching or Other Repair:	
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	
Exposed Aggregate	
Leaks through Walls	X
Structural Defects	
Moss	

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST09 – Miscellaneous Bulkhead – 1, 4.9 - East

Inspection Date: July 17, 2020
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)	X	Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor	X	Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	X
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST11
Miscellaneous Piles-2
Parcel No. N/A

WUS#: None

Facility Location: River Mile 4.3

Direction (side) West

STA 440+00 to STA 443+40

Site Overview

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photos 1 and 2).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP

PHOTOGRAPHS

Photo ST11-01: South Pile Field

Photo ST11-02: North Pile Field

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST11 – Miscellaneous Piles-2, 4.3 - West

Inspection Date: July 17, 2020
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST13
Breakwater
Parcel No. N/A

WUS#: 43

Facility Location: River Mile 4.1

Direction (side) West

STA 451+65 to STA 451+65

Site Overview

Asset Type: Timber Breakwater, Debris Deflector

Use: Shoreline Protection

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is located between Delta Marine Industries and the Duwamish Yacht Club. It consists of:

- Seven (7) sets of vertical and battered (toward the north) timber piles and horizontal timber slats (Photos 1 to 3).
- The piles appear to be in good condition, except several battered piles and slats are missing (Photos 1 and 2).
- Members are covered with moss within the tidal zone.
- Wood treatment is worn, but appears to be in good condition (Photo 3).

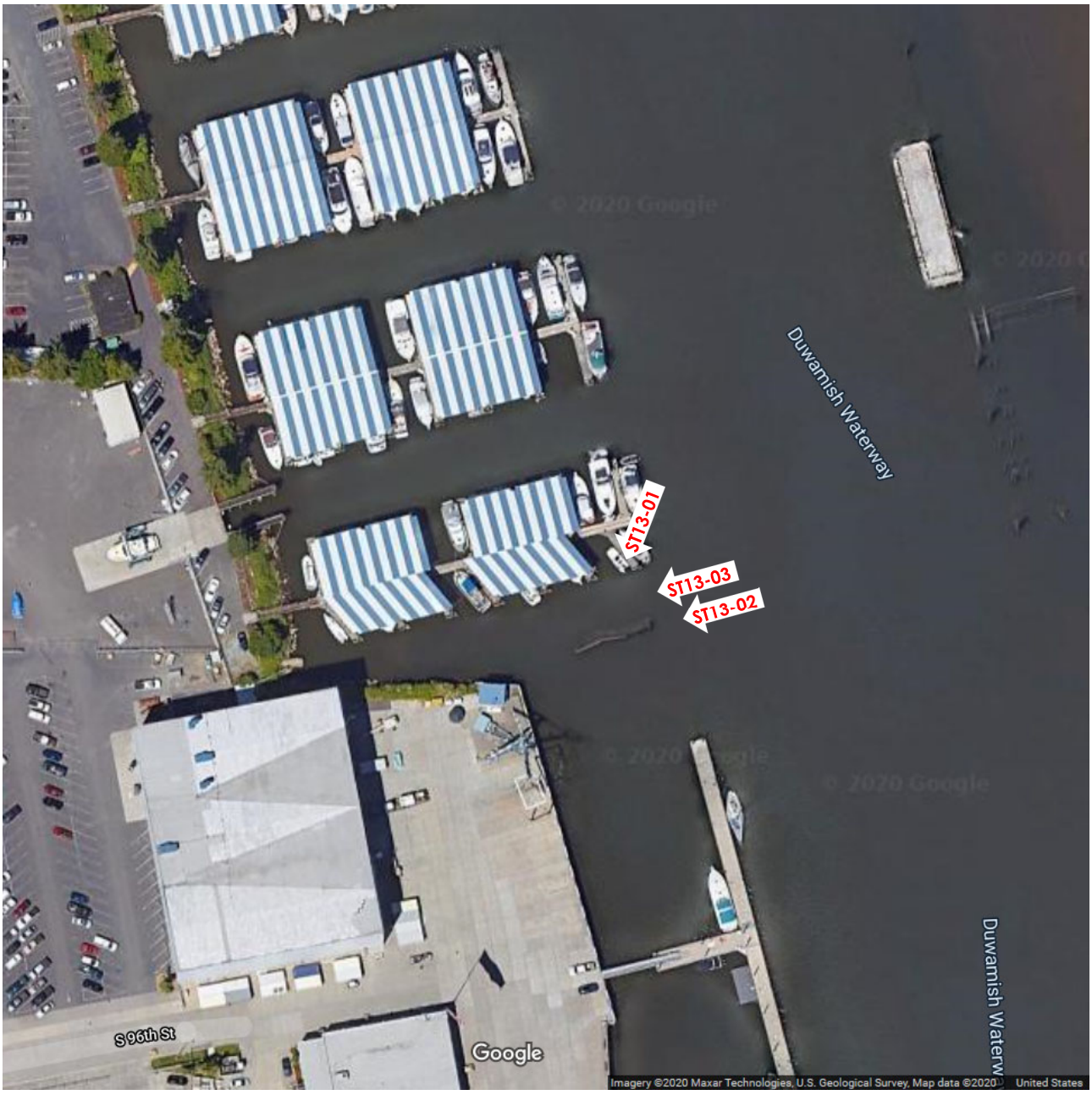
Accessibility:

- Access may be limited by the proximity of adjacent facilities: Delta Marine Industries and Duwamish Yacht Club.

Potential Hazards:

- The lateral stability of the piles is unknown.

VICINITY MAP



PHOTOGRAPHS

Photo ST13-01: Breakwater (Looking Northwest)

Photo ST13-02: Breakwater (Looking West)

PHOTOGRAPHS

Photo ST13-03: View of Battered Piles (Looking West)

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST13 – Timber Breakwater, 4.1, West

Inspection Date: June 15, 2020
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair	X	Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	
Loss of Material	
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	X
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST14
Travel Lift Pier
Parcel No. N/A

WUS#: 42

Facility Location: River Mile 4.1

Direction (side) West

STA 455+00 to STA 459+00

Asset Type: Pier

Use: Boat Lift

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure is located on the west bank/shoreline nestled between the two southern docks of the Duwamish Yacht Club marina. It consists of:

- Traveling gantry crane (east to west).
- Two (2) crane runways (north and south ends) each supported on offshore piers.
- Each pier consists of six (6) bents of braced (north to south) heavy timber piles and framing. No bracing in the east-west direction was observed.
- Steel soldier pile and concrete panel lagging bulkhead.
- The piles and framing appear to be in good condition, except for moss growth within the tidal zone.
- Preservative treatment on the timber piles and framing is worn, but appears to be in good condition.
- It appears that several steel bracings were added to the braced bents to provide additional lateral stability.
- The condition of the concrete bulkhead could not be closely observed. Appears to be in good condition except for corrosion on the steel piles and moss growth in the tidal zone.

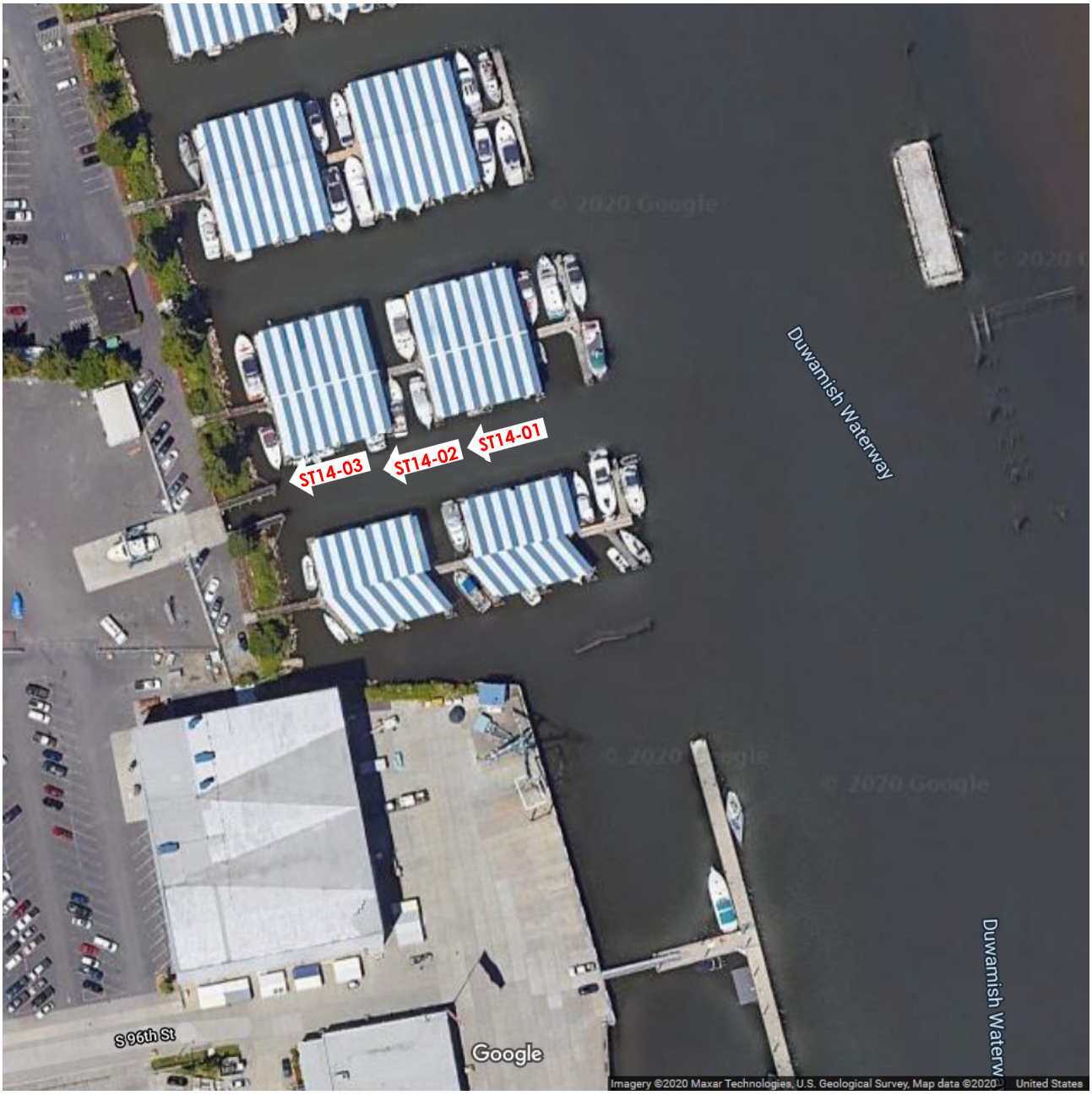
Accessibility:

- May be limited by (a) the adjacent docks along the approach and (b) the clearance around the boat lift pier.

Potential Hazards:

- The lateral stability of the pier is unknown.

VICINITY MAP



PHOTOGRAPHS

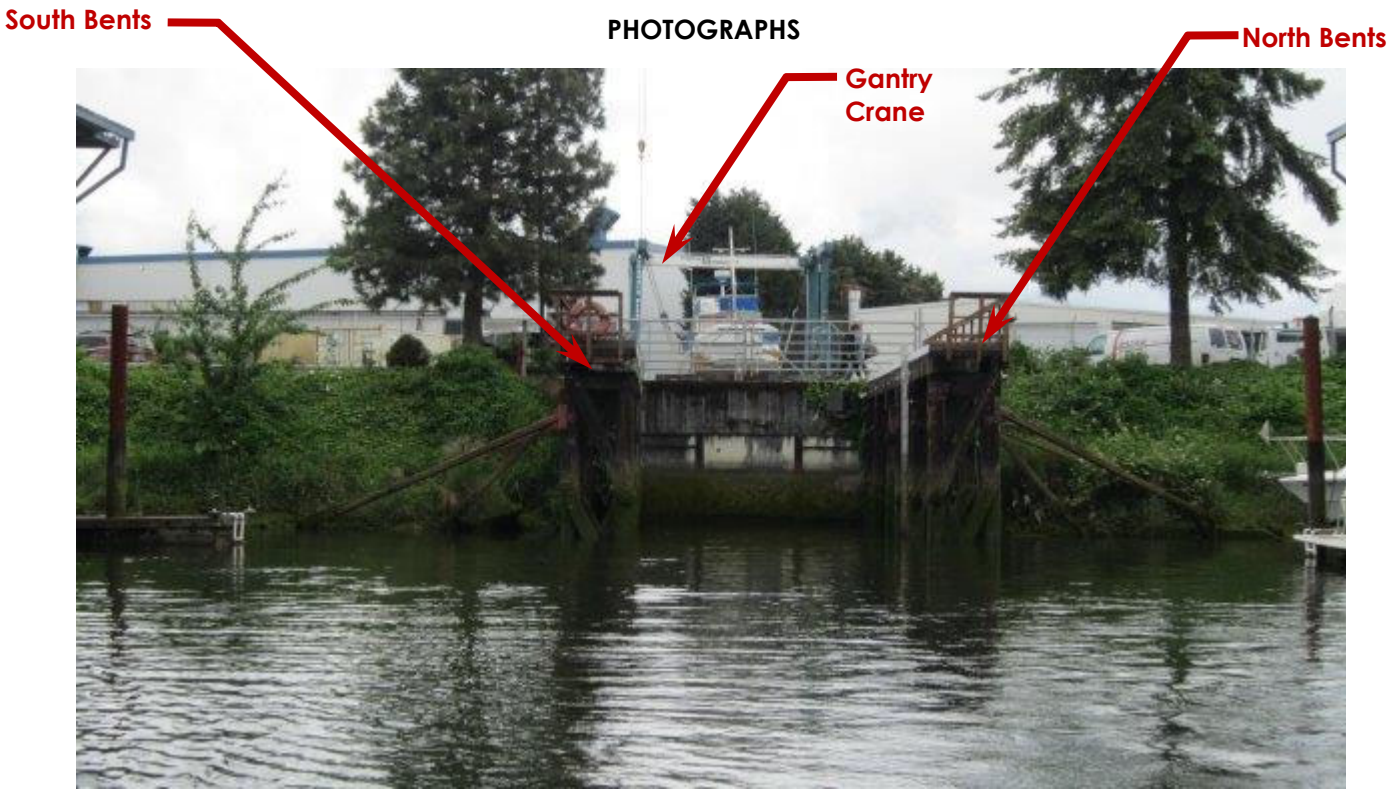


Photo ST14-01: Boat Lift (Looking West)

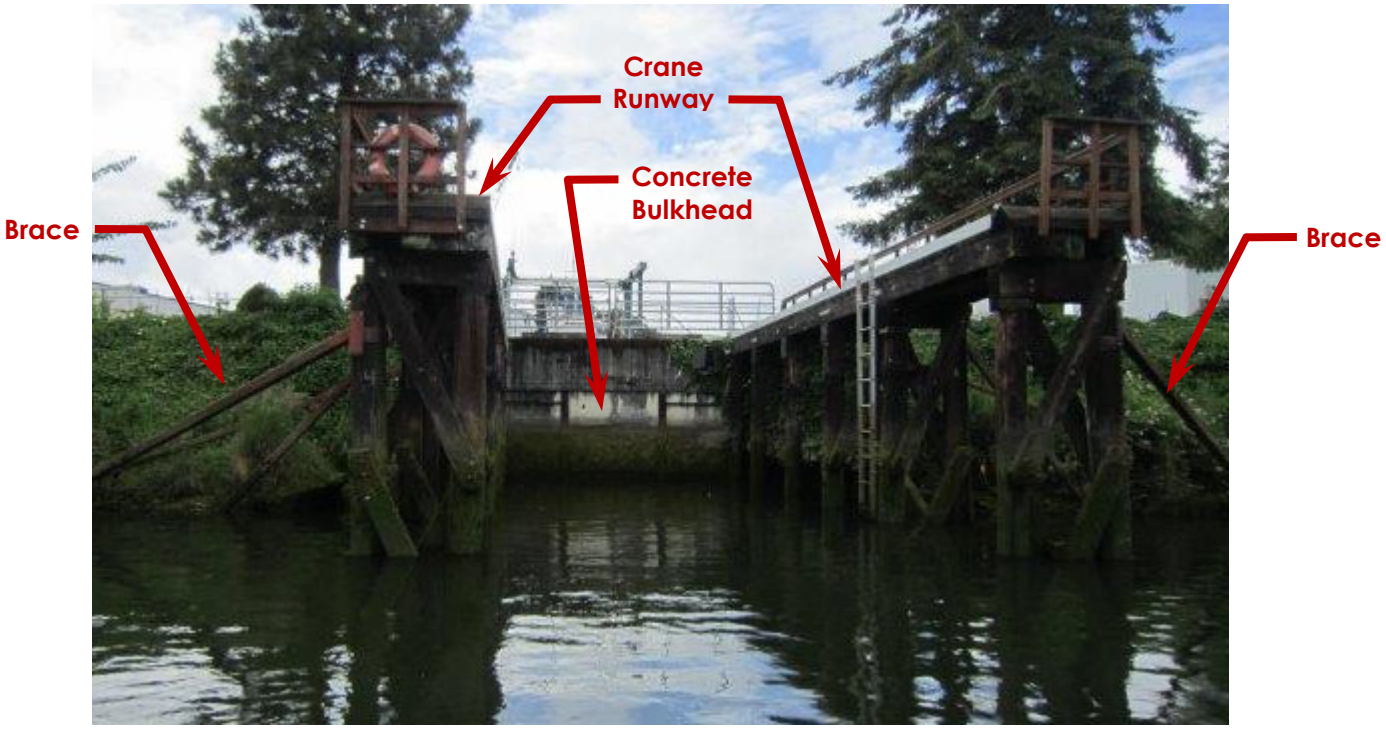


Photo ST14-02: Boat Lift Close Up

PHOTOGRAPHS

Photo ST14-03: North Bents

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST15
Duwamish Yacht Club
Parcel No. N/A

WUS#: 42

Facility Location: River Mile 4.1

Direction (side) West

STA 454+00 to STA 462+00

Asset Type: Marina

Use: Moorage of Recreational Vessels

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Concrete bulkhead along the west bank (Photo 1). The bulkhead was not accessible, therefore not observed.
- Four (4) gangways leading to the floats (Photos 1 and 2). The gangway was not accessed, therefore not observed.
- Four (4) parallel covered docks each with connection primary floating walkways.
- Timber float guide piles.

Float

- The roof framing system consists of corrugated steel deck supported by either open web steel trusses or cold-formed steel beams (Photos 2 to 5).
- The columns consists of a pair of either tubular steel posts or wood posts which are supported on the floats. The upper half of the posts are braced in both directions (Photos 2 to 5).
- The walkway of the floats are framed with timber and concrete surfacing (Photo 5).
- The pile guide is wood framed (Photos 2 to 7).

Guide Piles

- The guide piles are timber piles with a steel sleeve filled to the upper section (Photos 2 to 4, 6 and 7).
- The guide piles are covered in moss around the tidal zone but appear to be in good condition (Photos 2 to 7).
- The preservative treatment on the piles are worn but appear to be in good condition (Photos 2 to 7).

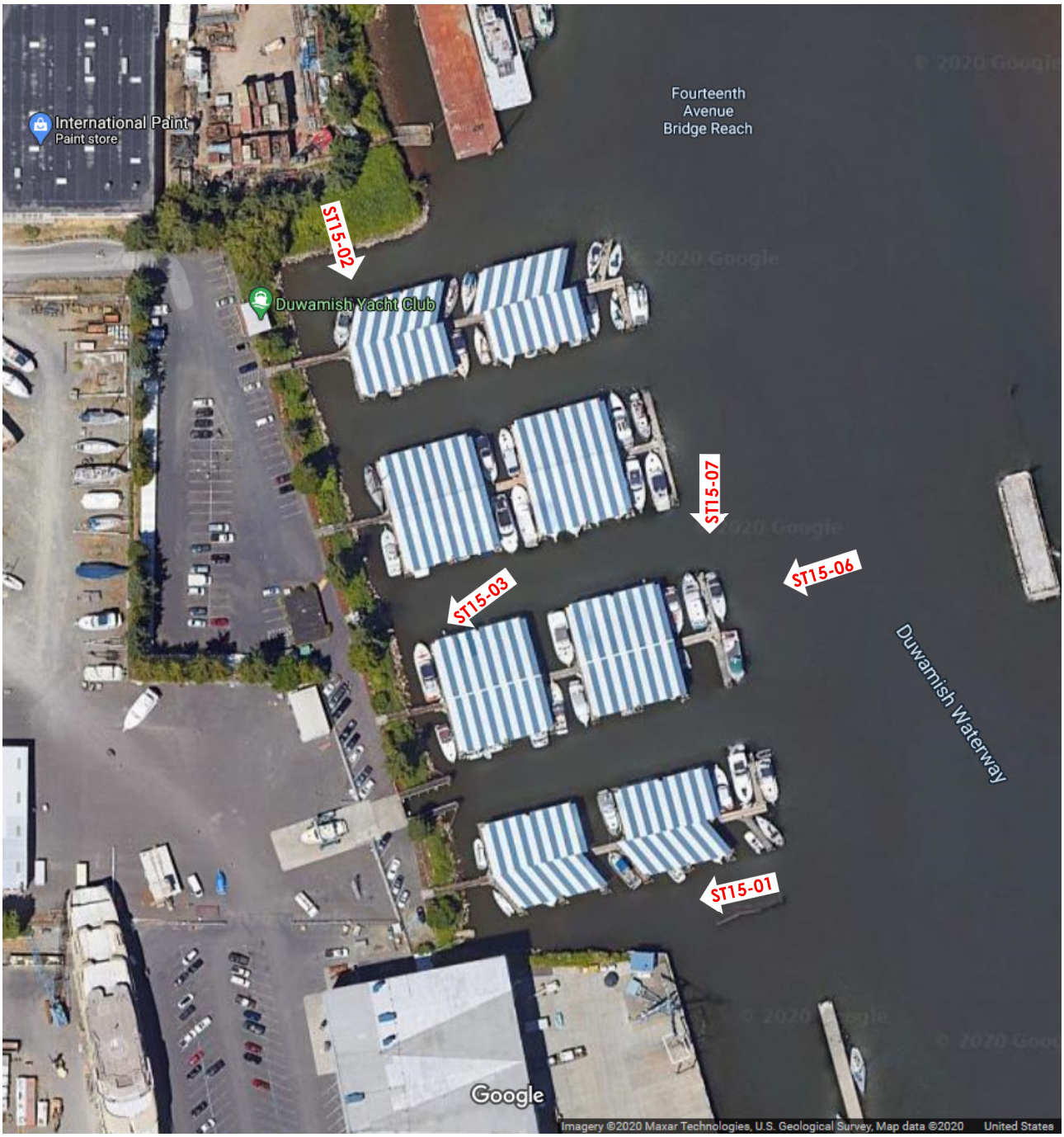
Accessibility:

- Clearance width may be limiting on three sides of the marina.
- Overhead covers over the moorage/floats.
- Limited space between floats.

Potential Hazards:

- The lateral stability of the piles is unknown.

VICINITY MAP



*Photos 4 and 5 could not be specifically located as they are "typical" depictions

PHOTOGRAPHS

Photo ST15-01: South-most Float (Looking West)

Photo ST15-02: Floats (Looking South)

PHOTOGRAPHS

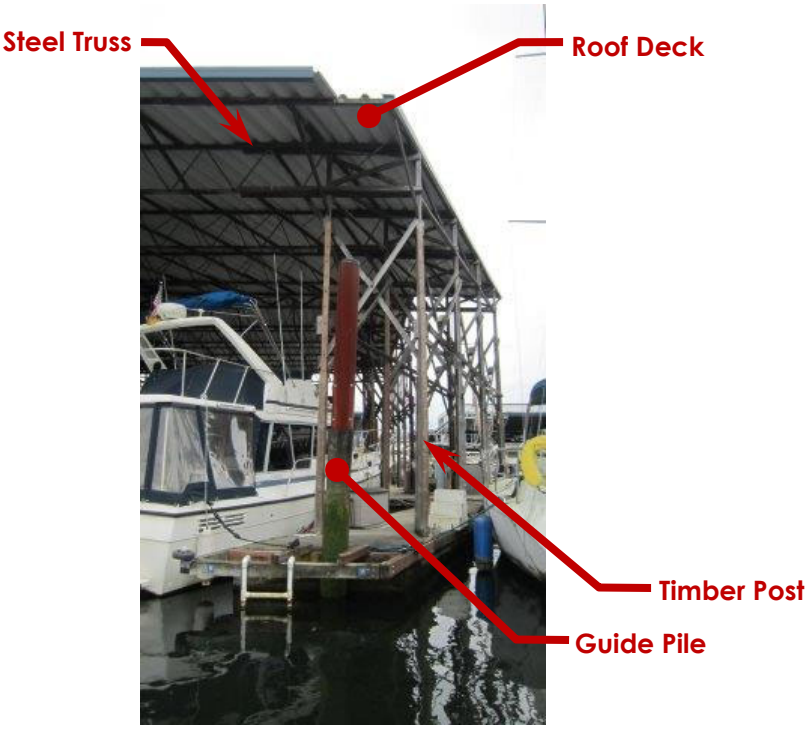


Photo ST15-03: Float Structure (Looking West)

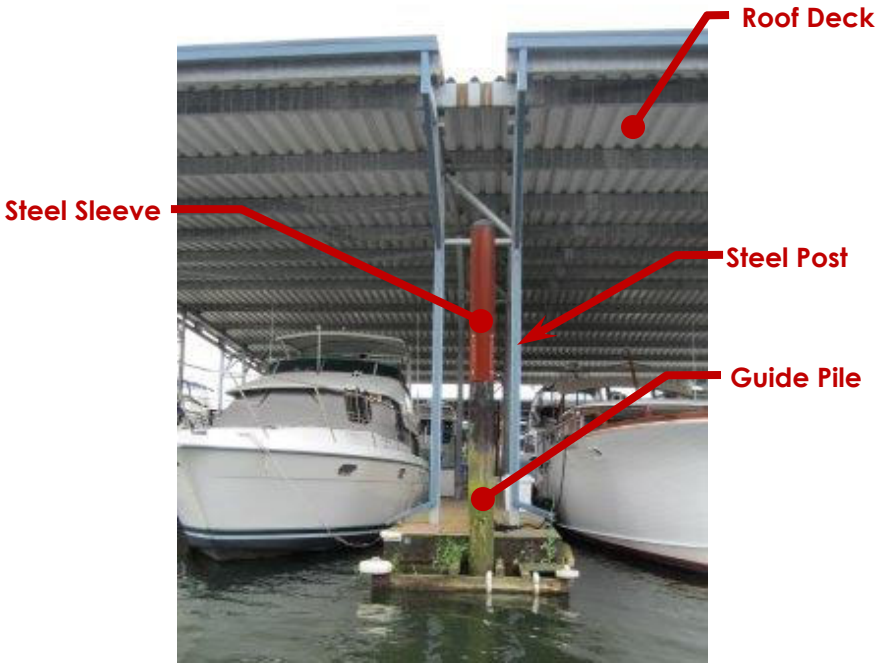


Photo ST15-04: Float Framing

PHOTOGRAPHS

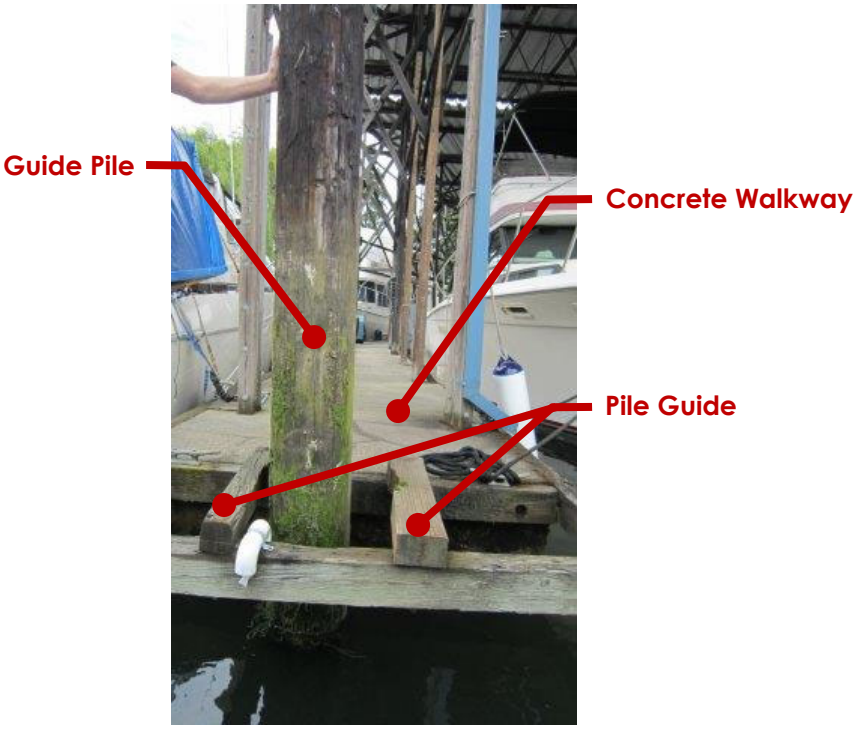


Photo ST15-05: Typical Float

Photo ST15-06: Outboard Float (Looking West)

PHOTOGRAPHS

Photo ST15-07: Outboard Float (Looking South)

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST15 – Duwamish Yacht Club, 4.1 - West

Inspection Date: June 15, 2020
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

	Cracking or breakage
	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	
Loss of Material	
Missing or broken members	
Damage or distress	
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	X
Debris Buildup	X
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST16
Kelly Ryan (formerly McElroy George and Associates, Inc.)
Parcel No. 1600060

WUS#: 40

Facility Location: River Mile 4.0

Direction (side) West

STA 464+00 to STA 466+10

Site Overview

Asset Type: Concrete Finger Piers

Use: Vessel Moorage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low and high tides. Observations and field measurements are limited to boat accessible areas. No physical measurements or close up observations were collected on the deck at this site.

Structure consists of four (4) connected finger piers (Photo 1). Each pier is approximately 20-ft wide x 36-ft long(in the east-west direction) and composed of:

- Five (5) rows of six (6) octagonal prestressed concrete pile bents. Piles on the 2nd and 5th bents are battered, the others are vertical.
- Five (5) rows of 34-in wide x 18-in deep concrete pile caps.
- Six (6) precast concrete haunched pier decks.
- Sets of two (2) timber fender piles at each pile cap and at mid-span of the pier decks.
- Steel sheet pile bulkhead.

Timber Fender Piles

- Majority of the fender piles are missing, broken, damaged, or in poor condition. Most pile straps are either missing or broken (Photos 2 to 5).

Concrete Piles

- The concrete piles appear to be in good condition except surface mortar erosion and moss growth in the wet/dry zone of the piles (Photos 6 and 7).
- There is a significant loss of concrete on the south face of the pile at Bent 4, Row 2. No exposed reinforcing or rust stains were observed (Photo 8).
- Approximately 12-in of the pile at Bent 2, Row 4 appears to be field built-up (Photo 9).

Concrete Caps

- The concrete surfaces of the pile caps appear to be in good condition. No cracks, spalls, or significant chips were observed (Photos 7 to 11).

Concrete Pier Decks

- Spall at the east face of both Pier 3 and Pier 4 decks. No exposed reinforcing or rust stains were observed (Photos 12 and 13).
- The concrete surface of the pier deck soffits appear to be in good condition (Photos 14 and 16).

Bulkhead

- A close observation of the steel sheet pile and concrete cap was not possible. There appears to be moss growth and rust in the wet/dry zone of the sheet pile (Photos 7, 10, 12, 14, and 15).

Accessibility:

- Accessibility to the structure depends on vessel size, height, draft, and tide level.
- The structure is accessible on the south and north sides. Access on the east side is obstructed by the fender piles.

Potental Hazards:

- Loose fender pile straps.
- Numerous piles are badly damaged, decayed, and/or unsound.

VICINITY MAP

PHOTOGRAPHS

Photo ST16-01: Pier Configuration

Photo ST16-02: Piers 2 to 4 (Looking Northwest)

PHOTOGRAPHS

Photo ST16-03: Piers 3 and 4

Photo ST16-04: Fender Pile

PHOTOGRAPHS

Photo ST16-05: Fender Pile

Photo ST16-06: Concrete Piles

PHOTOGRAPHS

Photo ST16-07: Concrete Piles (Looking Southwest)

Photo ST16-08: Concrete Pile

PHOTOGRAPHS

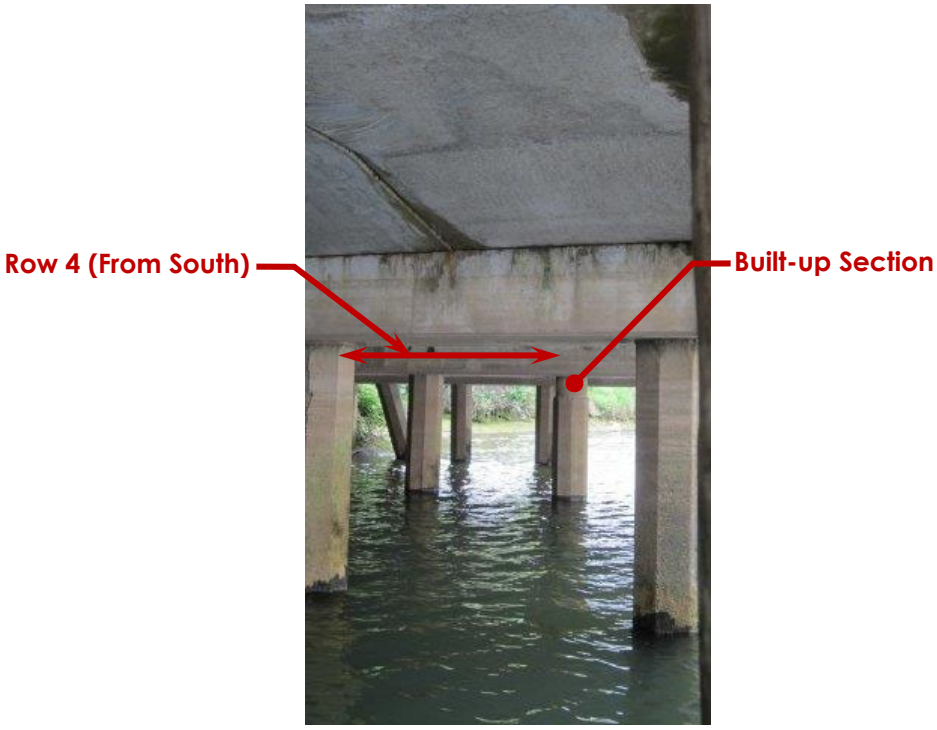


Photo ST16-09: Pile and Pilecaps

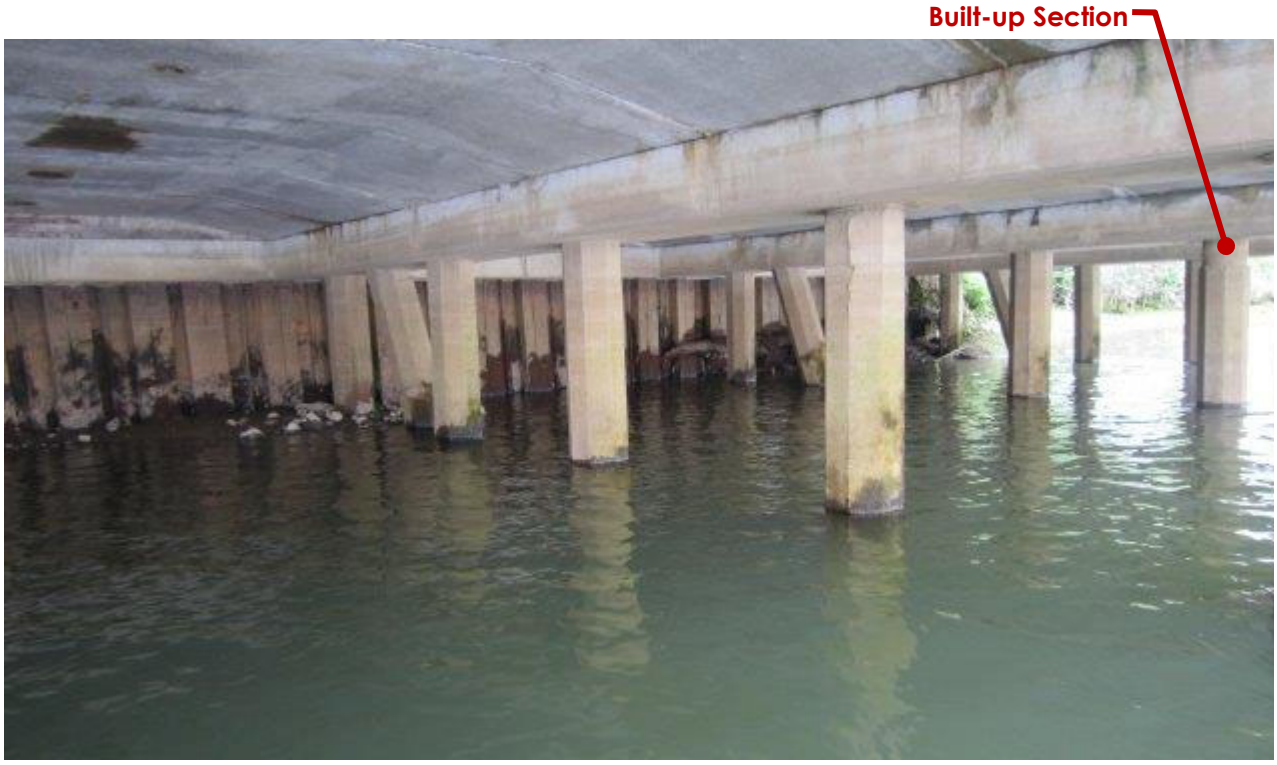


Photo ST16-10: Piles and Pile Caps (Looking Northwest)

PHOTOGRAPHS

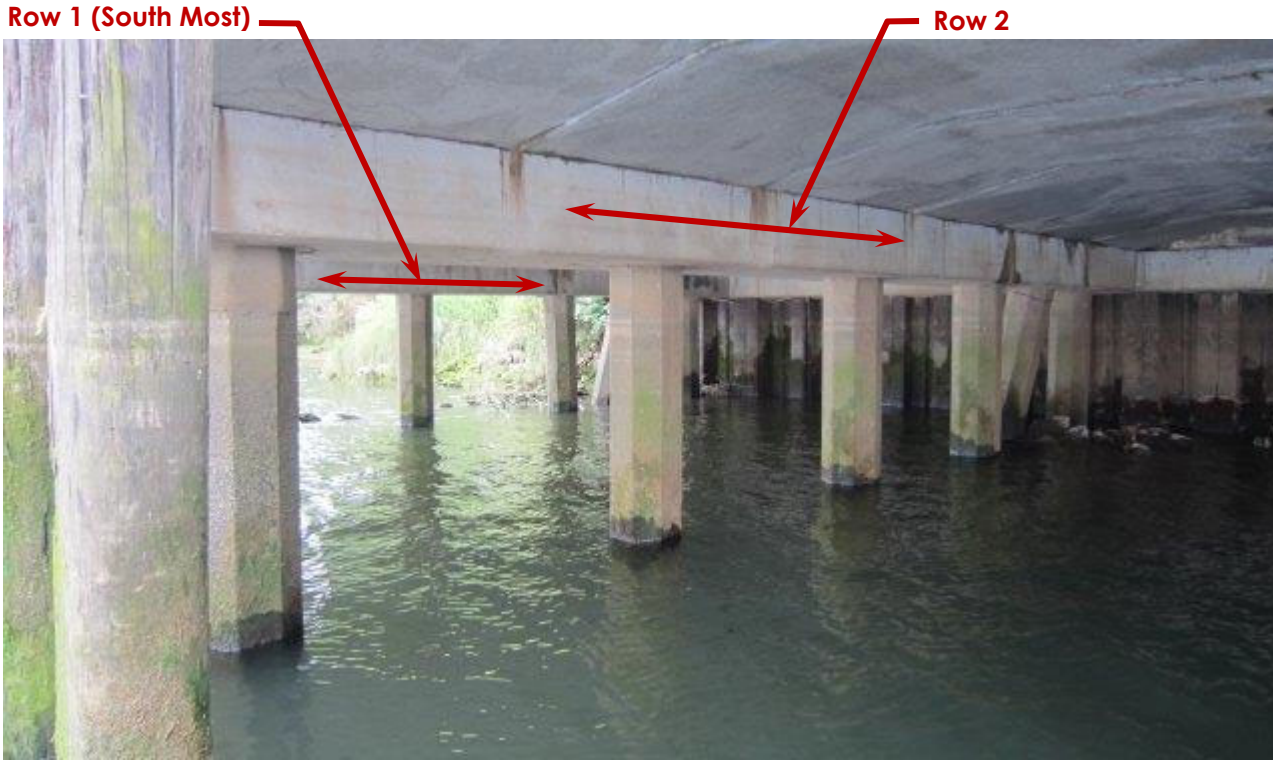


Photo ST16-11: Piles and Pile Caps (Looking Southwest)

Photo ST16-12: Pier 3 Pier Deck

PHOTOGRAPHS

Photo ST16-13: Pier 4 Pier Deck

Photo ST16-014: Bulkhead and Pier Deck Soffit (Looking West)

PHOTOGRAPHS

Photo ST16-15: Pier Deck Soffit

Photo ST16-016: Pier 4 Pier Deck (North Most, Looking West)

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST16 – Kelly Ryan, 4.0, West

Inspection Date: June 15, 2020
Prepared By: Ade Bright

CONCRETE MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Drainage		1C – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Flashing		Expansive soil
	Freezing and thawing		Joint sealants		Compressive soil (settlement)
X	Wetting and drying		Weepholes		Evidence of pumping
	Drying under dry atmosphere		Contour		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Elevation of drains		Steep or unstable slope/revetment
X	Abrasion, erosion, cavitation, impact				
	Heat from adjacent sources				

2. DISTRESS INDICATORS

X	Cracking or Breakage
X	Staining
X	Surface deposits and exudations
	Leaking

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Formed and finished surfaces – slippery, uneven, or misaligned	X
Cracking	X
Scaling	X
Spalls, pop outs, and delamination	X
Stains, Efflorescence	X
Exposed Reinforcement: Corrosion	X
Damage or distress	X
Missing or broken members	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	X
Curling and warping	X
Erosion	X
Previous Patching or Other Repair:	X
Surface Coatings, Protective Systems, Linings, Toppings	
Penetrating Sealers	
Signs of Past Overflow on Rungs and Walls	
Debris Buildup	X
Exposed Aggregate	X
Leaks through Walls	
Structural Defects	X
Moss	X

STEEL MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

	Member cracking or breakage
	Staining, corrosion
	Surface deposits
	Weld cracking or breakage

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good	X	Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	X
Cracking	
Rust and scale	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	X
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing	
Stains	X
Corrosion	X
Abrasion	X
Previous Repair	X
Surface Coatings	X
Debris Buildup	X
Structural Defects	X
Moss	X

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST16 – Kelly Ryan, 4.0, West

Inspection Date: June 15, 2020
Prepared By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
X	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical	X	Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	X
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	X
Fasteners: Corrosion	X
Soft timber and decay	X
Abrasion	X
Previous Repair	X
Surface Coatings, Protective Systems	X
Debris Buildup	X
Structural Defects	X
Moss	X

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST18
Miscellaneous Piles-4
Parcel No. N/A

WUS#: None

Facility Location: River Mile 3.8

Direction (side) West

STA 473+00

Site Overview

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photo 1).

Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP

PHOTOGRAPHS

Photo ST18-01: Piles

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST18 – Miscellaneous Piles-4, 3.8 – West

Inspection Date: July 17, 2020
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: ST21
Miscellaneous Piles-5
Parcel No. N/A

WUS#: None

Facility Location: River Mile 3.0

Direction (side) West

STA 503+50 to STA 520+50

Site Overview

Asset Type: Timber Piles

Use: Mooring

Inspection Date: July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☒ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Several scattered timber piles north of the S 98th St Bridge near the shoreline. They appear to have been cut down and are in poor condition (Photos 1 to 3).

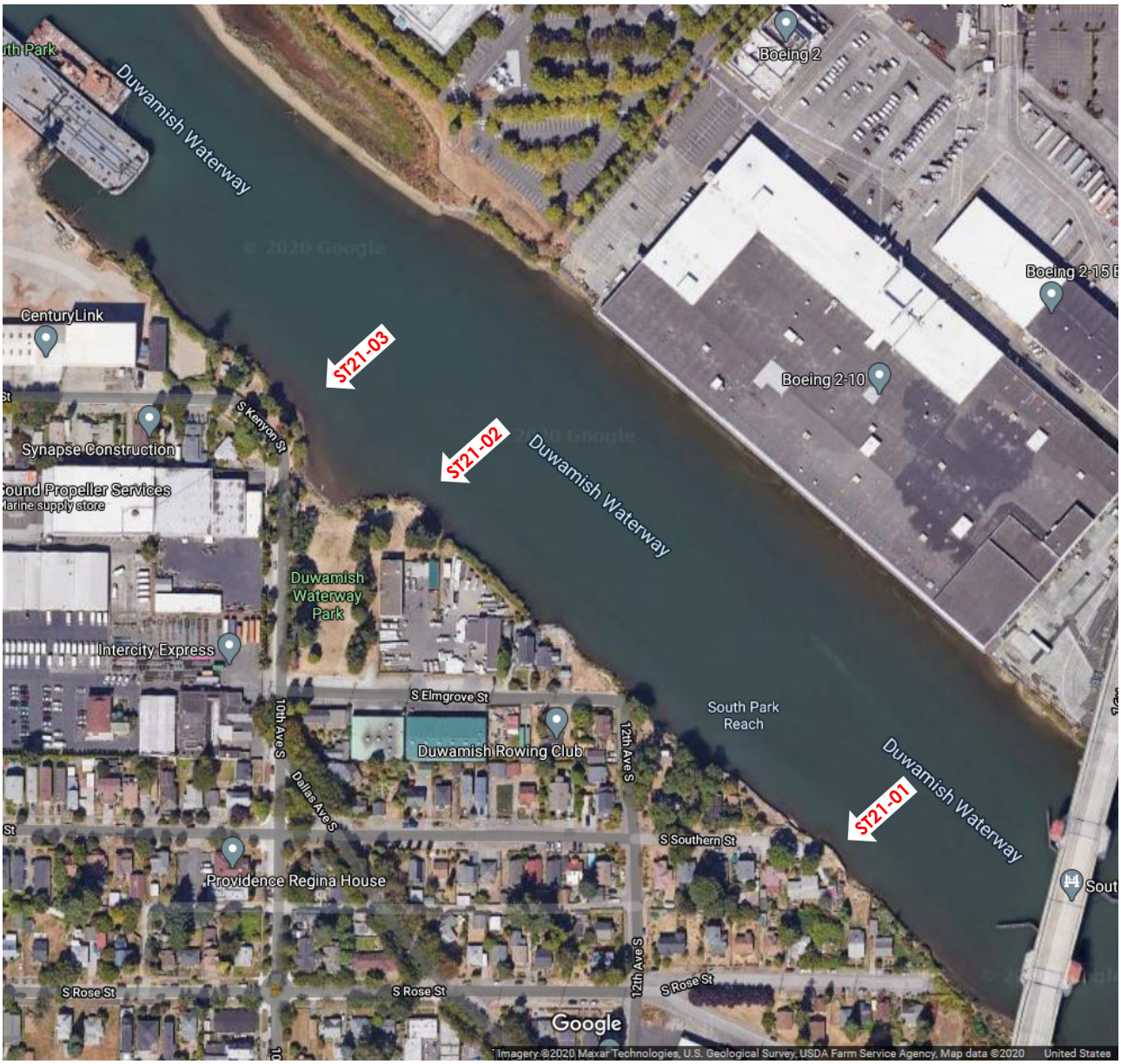
Accessibility:

- No obstruction observed.

Potential Hazards:

- None observed.

VICINITY MAP



PHOTOGRAPHS

Photo ST21-01: Southmost Pile Field

Photo ST21-02: Central Pile

PHOTOGRAPHS

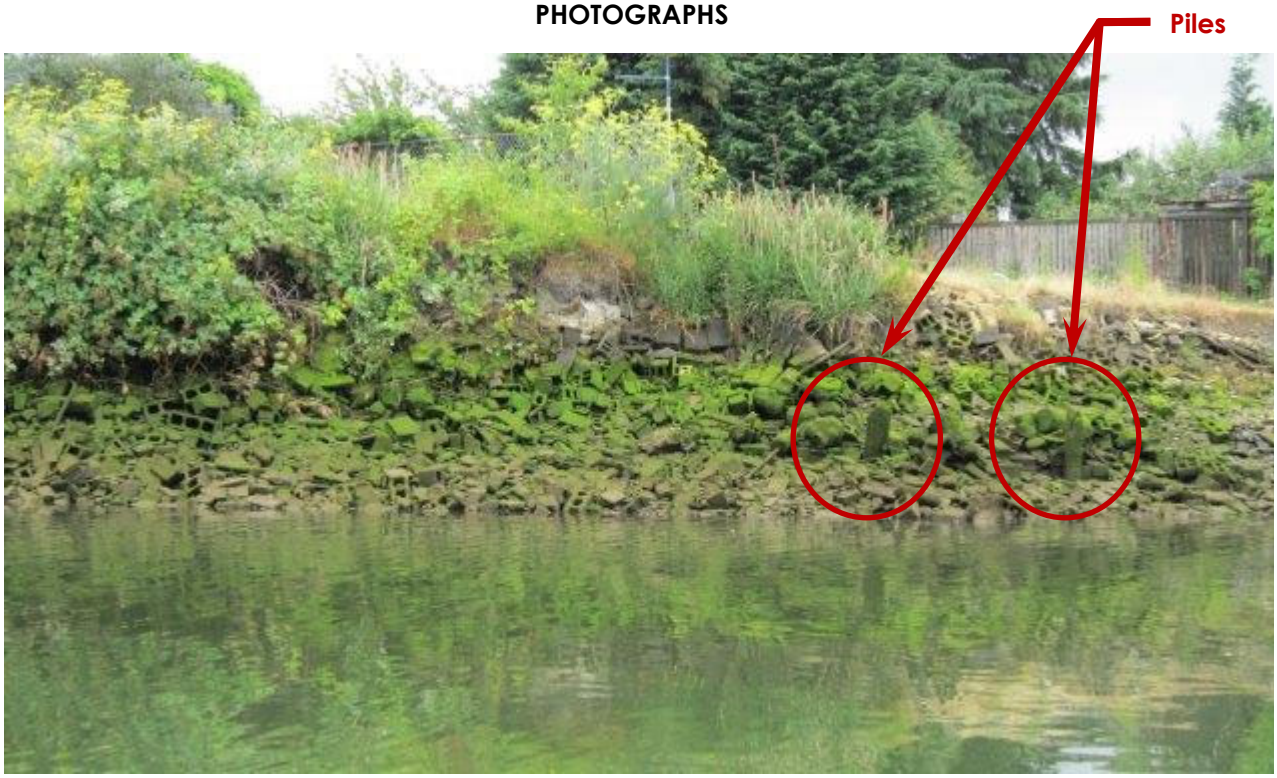


Photo ST21-03: Northmost Pile Field

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway
Facility: ST21 – Miscellaneous Piles-5, 3.0 - West

Inspection Date: July 17, 2020
Evaluation By: Ade Bright

WOOD MATERIAL VISUAL INSPECTION CHECKLIST

1. ENVIRONMENTAL CONDITION

1A – Exposure		1B – Soils (Foundation Conditions)	
X	Environment (Marine, Freshwater, Industrial, etc.)		Expansive soil
	Freezing and thawing		Compressive soil (settlement)
X	Wetting and drying		Evidence of pumping
	Drying under dry atmosphere		Scour
	Chemical corrosion and attack (Sulfates, Acids, Bases, Chloride, Gases)		Steep or unstable slope/revetment
X	Abrasion, erosion, impact		
	Heat from adjacent sources		

2. DISTRESS INDICATORS

X	Cracking or breakage
X	Rot and decay
X	Surface deposits
	Termite or Pest Infestation (Borer)

3. PRESENT CONDITION OF STRUCTURE AND POTENTIAL HAZARDS (Tripping, fall, fall through, slippery, impingement, and falling debris)

3A - Overall Apparent Alignment of Structure

	Settlement		Deflection/Leaning		Expansion		Contraction

3B – Surface Condition

General Condition	Excellent		New or near-new condition: no issues to report. No loss of cross section.
	Good		Good condition: no reported issues or concerns. Less than 5% loss of cross section.
	Fair		Average wear; not new but no issues to report. Between 5% - 20% cross section.
	Poor		Worn from use: Between 20% - 50% loss of cross section.
	Critical		Extremely worn or damaged: Between 50% - 80% loss of cross section.

Finished surfaces – slippery, uneven, or misaligned	
Cracking	X
Loss of Material	X
Missing or broken members	X
Damage or distress	X
Collapse, partial collapse or structure off foundation	
Damage or decay of chimney, parapet or other overhead falling hazard	
Ground or slope movement present	
Unstable supports – gaps or holes, excessive rotation, loss of bearing, rot	
Fasteners: Corrosion	
Soft timber and decay	
Abrasion	
Previous Repair	
Surface Coatings, Protective Systems	
Debris Buildup	
Structural Defects	
Moss	

Appendix F
Attachment F-2b Phase I Visual Inspection FCA Reports: Outfalls

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2064

Ecology ID: 2064

Facility Location: River Mile 3.6

Direction (side) East

STA 290+80

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15 and July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

Outfall was not observed during our inspection. GIS mapping information appears to indicate a 12-in CMP. No photos were taken.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2065

Ecology ID: 2065

Facility Location: River Mile 3.6

Direction (side) East

STA 289+90

Site Overview

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15 and July 17, 2020

Inspected By: Ade Bright

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

Outfall was not observed during our inspection. GIS mapping information appears to indicate an 18-in concrete pipe. No photos were taken.

Accessibility:

- Not observed.

Potential Hazards:

- None.

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2080

Ecology ID: 2080

Facility Location: River Mile 4.1

Direction (side) East

STA 324+60

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview
(within Slip 6)

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with duckbill valve surrounded by riprap. The pipe size, material and support were not observed (Photo 1).

Accessibility:

- There are no obstructions around the outfall.

Potental Hazards:

- None observed.

PHOTOGRAPHS

Photo 2080-01: Outfall (Looking North)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2081

Ecology ID: 2081

Facility Location: River Mile 4.2

Direction (side) East

STA 327+80

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview
(within Slip 6)

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were done.

The structure consists of:

- Outfall with duckbill valve and riprap protection projects a few feet beyond the shoreline. The pipe size, material, and support condition were not observed (Photo 1).

Accessibility:

- No obstruction observed.

Potental Hazards:

- Support stability of pipe overhang is beyond the riprap shoreline.

PHOTOGRAPHS

Photo 2081-01: Outfall (Looking North)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2082

Ecology ID: 2082

Facility Location: River Mile 4.2

Direction (side) East

STA 337+00

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview
(beneath Slip 6 piers)

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with duckbill valve surrounded with riprap and slightly overhangs beyond the shoreline. The pipe size, material, and support condition were not observed (Photo 1).
- Located in Clip 6 under the wharf between piers 4 and 5.

Accessibility:

- Outfall located under the wharf and between piers therefore access may be limited.

Potental Hazards:

- Overhead wharfs between piers 4 and 5.

PHOTOGRAPHS

Photo 2082-01: Outfall Between Piers 4 and 5 (Looking South)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2087

Ecology ID: 2087

Facility Location: River Mile 4.4

Direction (side) East

STA 351+20

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Concrete pipe uutfall projecting from the riprap armor (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- None noted.

PHOTOGRAPHS

Photo 2087-01: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2088

Ecology ID: 2088

Facility Location: River Mile 4.3

Direction (side) East

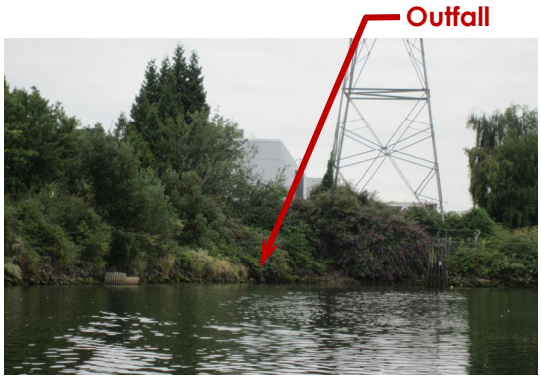
STA 349+10

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall at shoreline with riprap on two sides of the pipe (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- Support beneath the outfall was not verified.

PHOTOGRAPHS

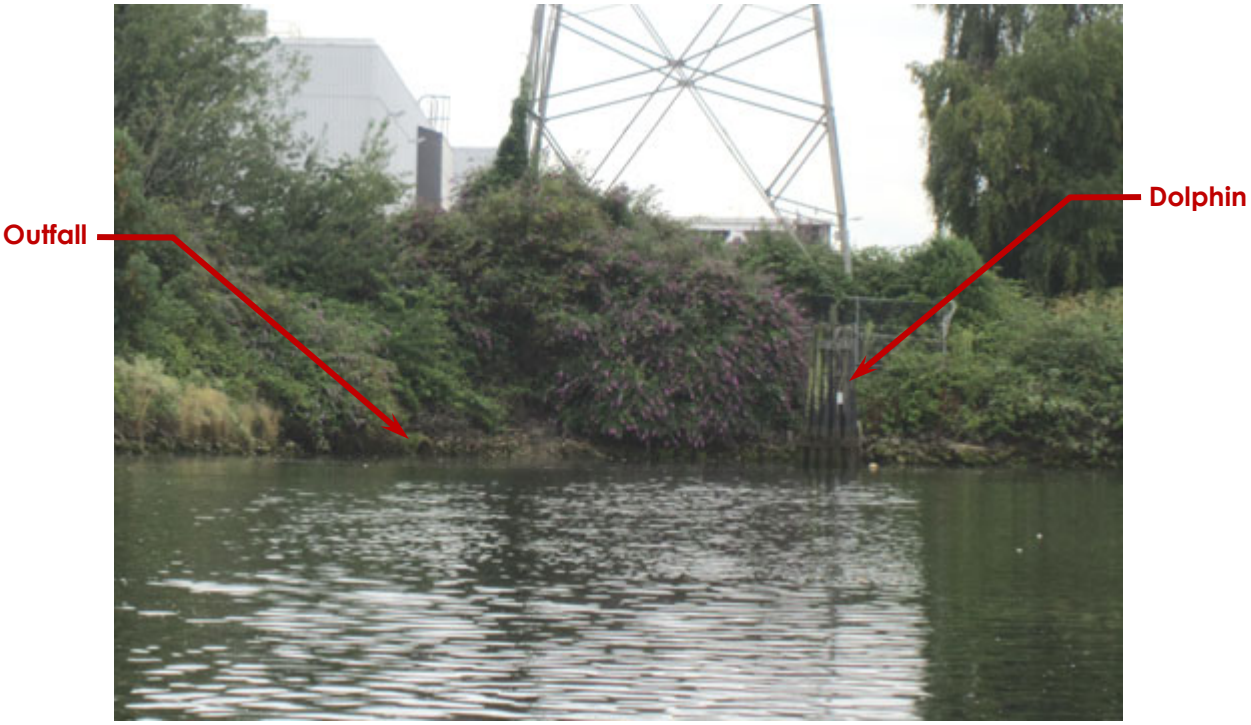


Photo 2088-01: Outfall North of Dolphin (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2089

Ecology ID: 2089

Facility Location: River Mile 4.3

Direction (side) East

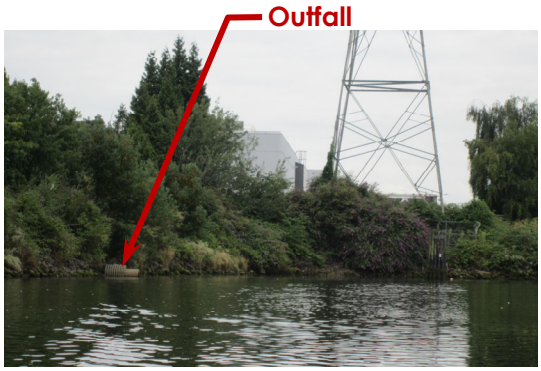
STA 347+40

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright



Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with armor and corrugated steel encased concrete collar is projected beyond the shoreline. It does not appear that riprap surrounds the outfall (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- Support of the outfall projection was not observed.

PHOTOGRAPHS

Photo 2089-01: Outfall (Looking Southeast)

Photo 2089-02: Outfall (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2090

Ecology ID: 2090

Facility Location: River Mile 4.5

Direction (side) East

STA 358+80

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with duckbill valve at the shoreline, surrounded with riprap (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- Condition of support beneath the outfall was not be observed.

PHOTOGRAPHS

Photo 2090-01: Outfall (Looking East)

Photo 2090-02: Outfall

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2098

Ecology ID: 2098

Facility Location: River Mile 4.4

Direction (side) West

STA 433+90

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Corrugated steel pipe projecting several feet beyond the shoreline surrounded by riprap (Photos 1 and 2).
- Moss growth around the pipe (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- Overhead electrical power transmission lines.

PHOTOGRAPHS

Photo 2098-01: Outfall (Looking West)

Photo 2098-02: Outfall (Looking West)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 2100B

Ecology ID: 2100B

Facility Location: River Mile 4.1

Direction (side) West

STA 454+00

Asset Type: Outfall

Use: Drainage

Inspection Date: June 15, 2020

Inspected By: Ade Bright and Stephanie Lor

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Corrugated steel pipe projecting between soldier pile wall with a bend (Photos 1 and 2).
- Moss growth around the pipe (Photo 1).
- Pipe size, material, and support condition were not observed.

Accessibility:

- Limited by the width between adjacent structures and guide piles.

Potental Hazards:

- Support beneath the pipe was not observed.
- Adjacent floating decks and guide piles.

PHOTOGRAPHS

Photo 2100B-01: Outfall at High Tide Level

Photo 2100B-02: Outfall at Low Tide Level

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: King County Outfall (3031)

Ecology ID: 3031

Facility Location: River Mile 3.2

Direction (side) East

STA 266+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall is located north of the South Park Bridge east piers and is situated on the riverbank surrounded with riprap (Photos 1 and 2).
- The outfall pipe is fitted with a duckbill valve, which appears not to be totally submerged at high tide (Photos 1 and 2).
- The pipeline size, material, and condition could not be observed and thus not known.

Accessibility:

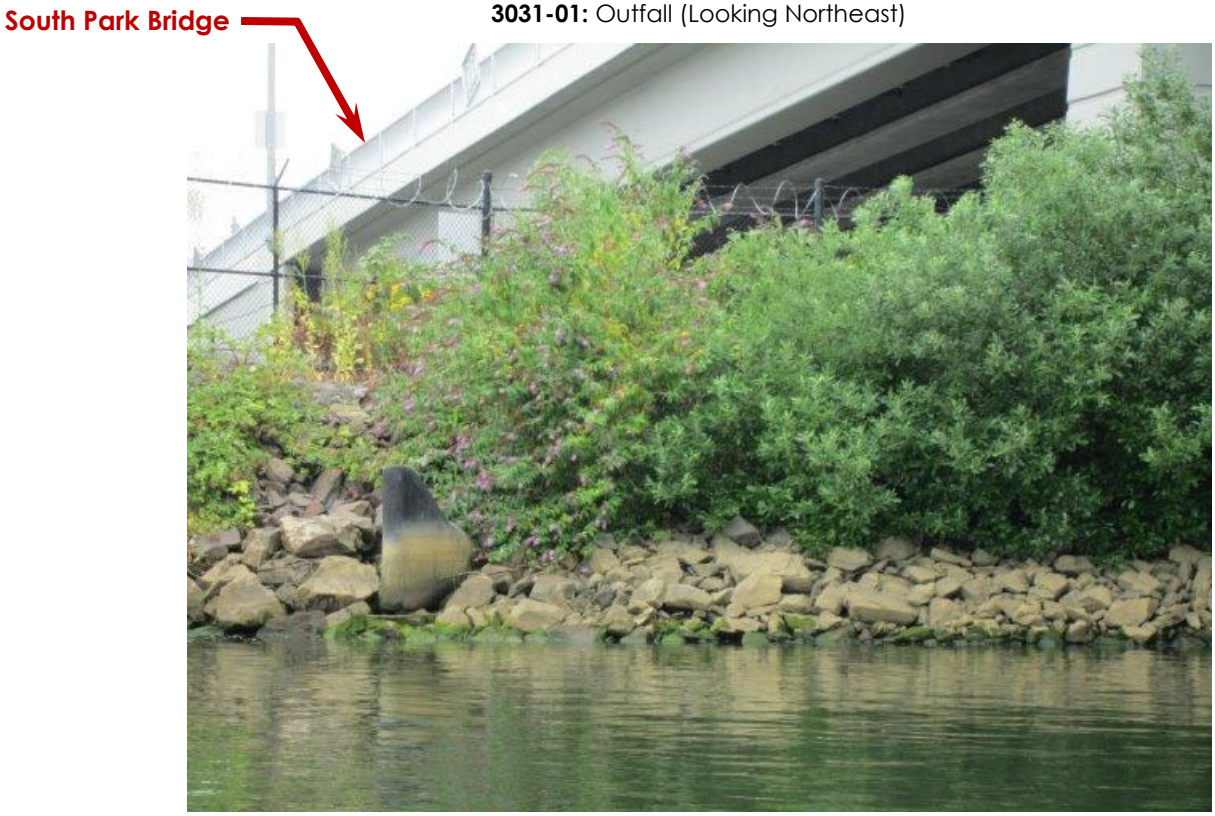
- The outfall is accessible from the landside and with possible restricted accessibility from the water side.

Potental Hazards:

- The river bank is armored with riprap and appears to be stable.

PHOTOGRAPHS

3031-01: Outfall (Looking Northeast)



3031-02: Outfall (Looking Northeast)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: 3032

Ecology ID: 3032

Facility Location: River Mile 3.2

Direction (side) East

STA 267+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close-up observations were completed.

The structure consists of:

- The outfall is located under and almost directly west of the South Park Bridge south pier. It projects several feet out of a 3-sided steel sheet pile bulkhead, and the projection is protected by three timber piles on the north and south sides. (Photos 1 and 2)
- The toe of the shoreline around the bulkhead is protected with riprap; however, support for the pipeline could not be observed.
- The pipeline size, material, and the condition, as well as the condition of the flap gate and timber piles, could not be observed.

Accessibility:

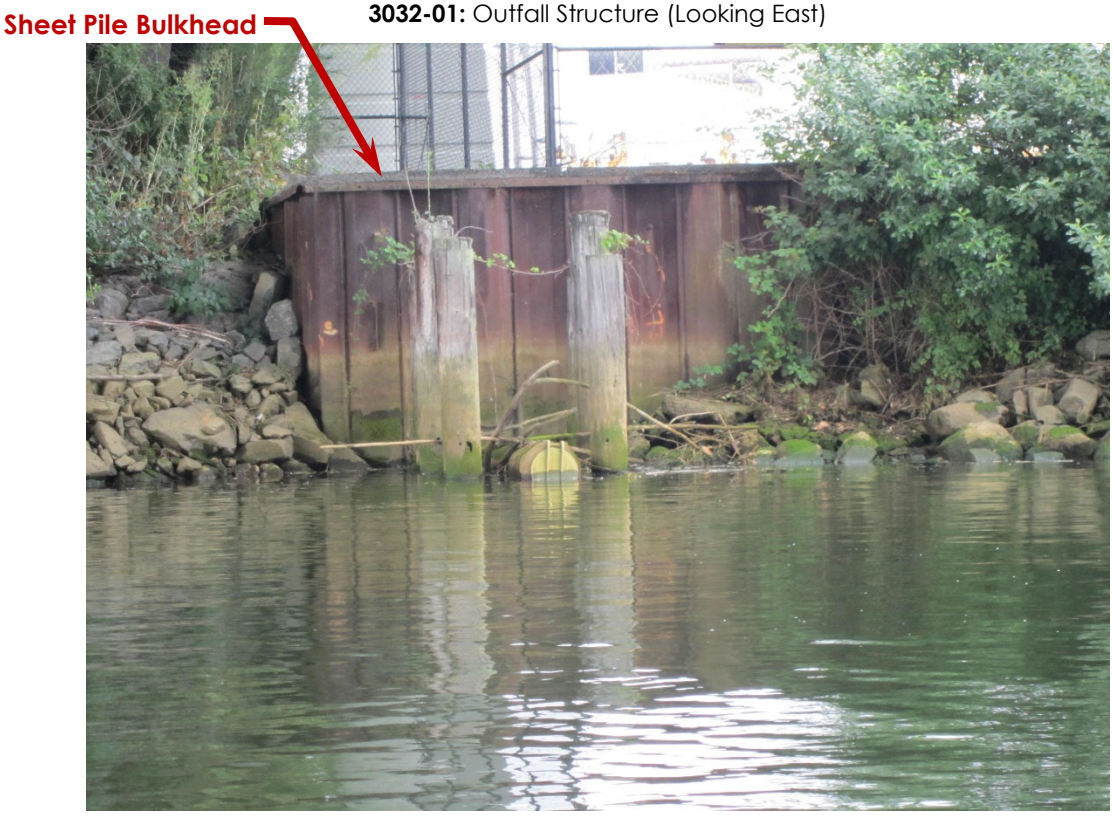
- The outfall appears accessible from the bulkhead and with restricted access from the river side.

Potential Hazards:

- Riprap armoring around the outfall, hence their stability, could not be observed.

PHOTOGRAPHS

3032-01: Outfall Structure (Looking East)



3032-02: Outfall Structure

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: BDC-1

Ecology ID: BDC-1

Facility Location: River Mile 4.3

Direction (side) East

STA 349+50

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☒ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall is encased with concrete and projects slightly beyond the shoreline. It is surrounded with riprap (Photos 1 and 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- Support beneath the outfall was not verified.

PHOTOGRAPHS

Photo BDC-1-01: Outfall South of Dolphin (Looking East)

Photo BDC-1-02: Outfall South of Dolphin (Looking East)

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: Boeing 1

Ecology ID: Boeing 1

Facility Location: River Mile 3.0

Direction (side) East

STA 253+00

Asset Type: Outfall with Duckbill Valve

Use: Marine Outfall

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with duckbill valve situated near shoreline, surrounded with riprap protection (Photo 1).
- Pipe material, size, and condition are unknown.
- Outfall is located at the north end of Boeing Plant 2 Building (Photo 2).
- Lower half of duckbill valve is open.

Accessibility:

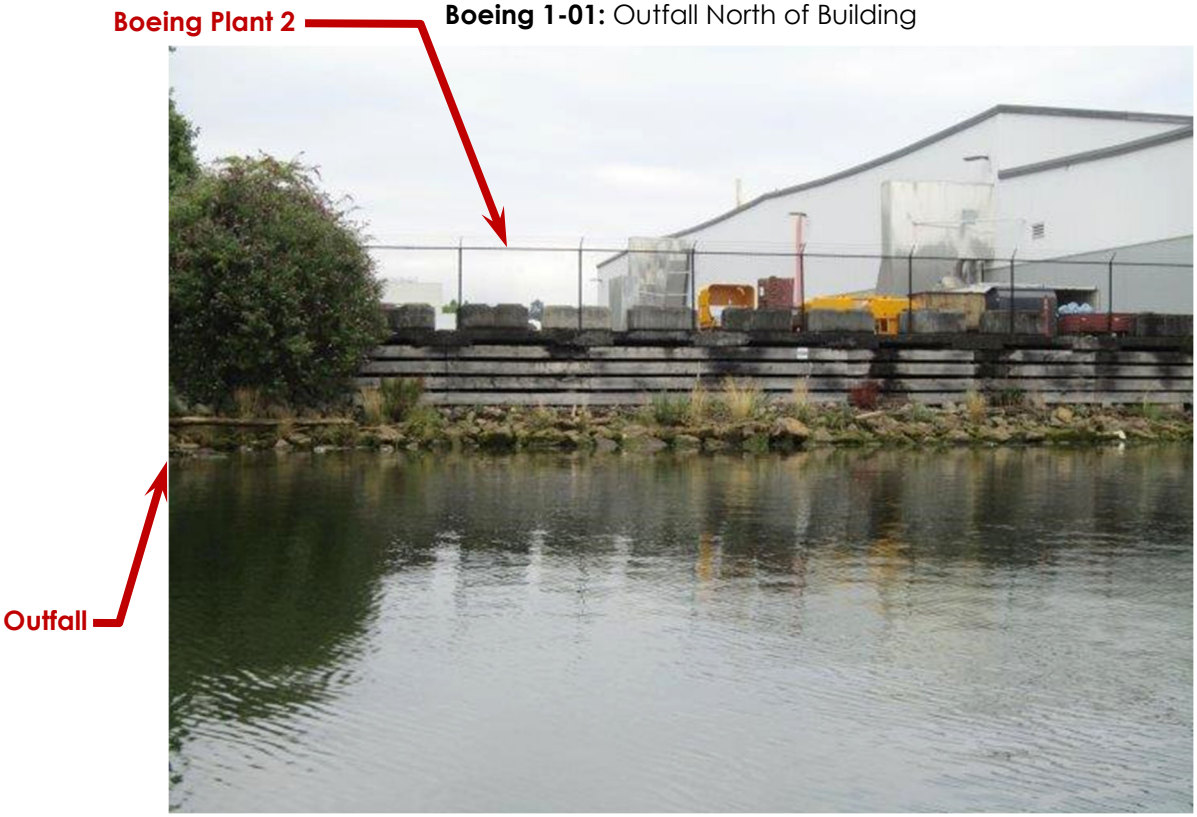
- No obstruction is observed.

Potential Hazards:

- None noted.

PHOTOGRAPHS

Boeing 1-01: Outfall North of Building



Boeing 1-02: North End of Building

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: Ditch #2

Ecology ID: Ditch #2

Facility Location: River Mile 4.9

Direction (side) West

STA 387+00

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall with a duckbill valve is nested in the bushes over the shoreline and appears to be surrounded with riprap (Photos 1 and 2).
- The valve appears to be open (Photo 2).
- Pipe size, material, and support condition were not observed.

Accessibility:

- No obstructions observed.

Potental Hazards:

- None observed.

PHOTOGRAPHS

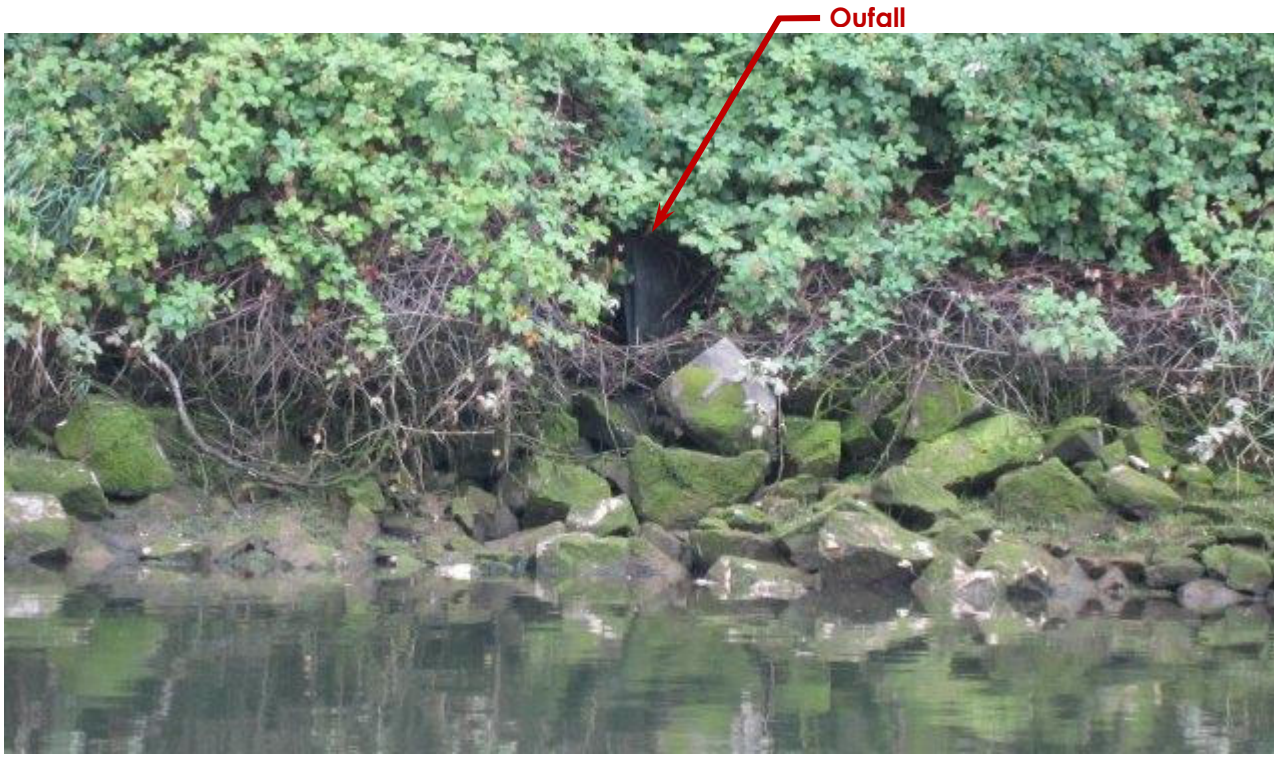


Photo Ditch #2-01: Outfall (Looking West)

Photo Ditch #2-02: Enlarged Outfall Valve

FACILITIES CONDITION ASSESSMENT REPORT

REVISION 01/31/2022

Sediment Cleanup of Upper Reach of Lower Duwamish Waterway, Phase I

Facility Name: SP3

Ecology ID: SP3

Facility Location: River Mile 3.9

Direction (side) West

STA 476+60

Asset Type: Outfall

Use: Drainage

Inspection Date: July 17, 2020

Inspected By: Ade Bright

Site Overview

General Condition and Evaluation:

Overall Condition Rating: ☐ Good ☐ Satisfactory ☒ Fair ☐ Poor ☐ Serious ☐ Critical

Inspection was conducted from the water side and during low tide. Observations are limited to boat accessible areas. No physical measurements or close up observations were completed.

The structure consists of:

- Outfall projects into the shoreline and is supported on a mound of riprap (Photos 1 and 2).
- Size, material, and condition were not observed closely.

Accessibility:

- Minor obstruction consists of dead branches around the outfall.

Potental Hazards:

- None observed.

PHOTOGRAPHS

Photo SP3-01: Outfall (Looking West)

Photo SP3-02: Close Up of Outfall